# GAS JOURNAL

## LIGHT ⁘ HEAT ⁘ POWER ⁘ BYE-PRODUCTS

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PROPRIETORS: WALTER KING, LIMITED. OFFICE 11, BOLT COURT, FLEET ST., LONDON, E.C. 4.

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# Editorial Notes.

## Tar and the Small Gas-Works.

THE underlying purpose of a paper read by Mr. G. E. Childs, of Ferndale, at last Wednesday's meeting of the Wales and Monomouthshire District Institution of Gas Engineers and Managers was to seek opinion as to whether or not it would be more profitable for isolated, small, and medium-sized works to distil their make of tar and market the products in their own districts. We gain the impression that he thinks there is a great deal to be said for the practice. In the vicinity of most small undertakings, he observes, there is a demand for prepared tar equivalent to the output of the works; by judicious advertising and a display in the showroom a demand could easily be created for the light oils and naphthalene produced—the former being sold as a preservative for wood, the latter, mixed with lime, as an insecticide and weed-killer—and the ammoniacal liquor could be marketed as a fertilizer.

We published an interesting article in our columns a short time ago (Vol. 187, p. 305), dealing with the research work which has been carried out in Germany, Denmark, and France into the possibility of using liquor as direct fertilizer. It may be said at once that application without special precautions is disastrous, owing to the presence in the liquor of phenols, sulphuretted hydrogen, cyanogen, pyridine bases, and naphthalene—compounds which are poisonous to vegetation. However, the necessary precautions are set out in the article to which reference is made, and if they are observed, then ammoniacal liquor constitutes an excellent manure. In Germany, for at least twenty years, a large number of gas-works have disposed of their make to farmers; and there seems no reason why an effort in the same direction should not be made here.

To return to the main purport of Mr. Childs' paper, the author states definitely that, to produce a good road tar, and to see that the right quality and particular properties are maintained, strict control from the laboratory is absolutely essential. Crudes must be carefully tested, and the whole process of distillation must be treated scientifically. There will be general agreement with this view, for only in this way can our industry gain the much-needed confidence of road surveyors and road users. Admittedly the tests suggested by Mr. Childs are not difficult, but they require accommodation, time, and trained staff, none of which may be available or possible in a small works. In brief, it is too much to expect of the humble haberdasher what one would expect of Mr. Selfridge. Tar for roads must be suitably refined and of constant composition; and if on occasion an inferior batch is supplied to the surveyor, the harm done affects not only the particular undertaking concerned, but the status of gas tar generally. Moreover, as Mr. W. E. Cone, the Technical Adviser to the British Road Tar Association, recently observed, the preparation of road materials becomes more and more the province of the scientist and chemist, and there is an insistent need for further experiment and research in the selection and blending of tars. For example, the combination of pitch and heavy and middle oils to give the required properties of adhesiveness, penetration, and durability under traffic and weather conditions necessitates careful proportioning.

There is another point. The carbonizing plant and conditions on certain of the smaller works can hardly result in a first-class road tar; and yet these small undertakings can always find an outlet for their product by some co-operative scheme. A large distillery, having full facilities for blending, can make good use of a tar which, distilled alone, would produce an inferior road surfacing material, and, further, can ensure—by blending in the refined state—uniformity of the product supplied to surveyors. Whether a small concern would find it profitable to work-up its tar is—like so many other gas-works problems—a matter which can be decided only by consideration of local circumstances. If the answer is in the affirmative, then the whole energy of the producer must be centred in marketing a material which in quality and uniformity is certain to add prestige to the reputation of the gas industry. Doubtless the small undertaking will, by study of Mr. Childs' contribution, gain much valuable knowledge on the economical lay-out and efficient working of a tar distillation plant.

## A City Sensation.

ONLY a week ago the statement was made in the "JOURNAL" that it had come as a great shock to the more trustful portion of the investing public to find that underwriting was no guarantee whatever that the expected proceeds of a share issue would be realized. Often enough, we then said, the investor "finds himself with few of the trumps "in his hand; but he is at least entitled to count upon "a square deal." At that time, in addition to the underwriting trouble, certain shares had suffered a disconcerting fall. All that had gone before, however, was eclipsed by the shock produced towards the end of last week by the troubles of a number of companies associated in one way or another with the name of a well-known financier. It will be some while before the full extent of the disaster can be gauged; but even now there is little room for hope that the small capitalist class will escape without heavy loss.

We have no desire to join the great band of "I Told You So's;" neither have we any wish to speak for the average City man, who, knowing the risks he runs, may be adjudged capable of taking care of himself. Our only concern is that the small capitalist—who is essential to the country's well-being—should be safeguarded as far as

practicable. One method is to be found in the new thrift schemes to which attention was drawn in these columns a fortnight ago. These are the subject of a free descriptive booklet issued by the National Savings Committee, Sanctuary Buildings, Westminster, London, S.W. 1, and have been already adopted by a number of gas undertakings. They can be readily arranged to meet particular requirements, and are deserving of careful consideration by those who have at heart the welfare of the country, and therefore of the small capitalist. It must, however, always be the case that there is a desire on the part of some persons of small means to invest money through the ordinary channels; and in doing so they have every right to expect protection. It surely cannot be beyond the wit of the big financial institutions of the great City of London to devise means for removing at any rate some of the pitfalls by which the small investor is beset. As we have already said, the promotion of companies, and business in their shares, bring profit to certain people; and it is for them to see that proper safeguards are provided.

Last week's events must not be judged at present; but sufficient has already been revealed to give ground for the greatest anxiety that there shall not be a repetition. We feel sure that the Stock Exchange Committee will leave no stone unturned in their efforts to safeguard the public, who rely upon them for protection, and whose interests, after all, are their own.

## Vertical Retorts for Small Works.

ANOTHER problem of the small works—the main one of cheap and efficient gas production—is being considered to-day by Mr. J. E. Blundell, Engineer and Manager to the Carlisle Gas Department, in a paper before the Cumberland and Westmorland Gas Managers' Association; and it is obvious that, whatever doubts may have lingered in his mind in the past as to the economy of vertical installations of small capacity, he has none whatever to-day. He regards the vertical retort as the best means of procuring for the small works those advantages in the handling of materials, improvement of labour and management conditions, and higher technical efficiency, which are available for the larger works.

Small works will experience greater difficulties in the near future. We refer, of course, to competition from the electrical grid. In many instances, no doubt, co-operative working or amalgamation will minimize this competition. But an area such as Cumberland and Westmorland does not lend itself to grandiose schemes of interconnecting pipes; for the most part the gas undertakings have an annual output of from 25 to 60 million c.ft., and—what is more important—they are scattered units serving a sparse population. The question is, therefore, to quote Mr. Blundell, how to introduce modern methods of gas manufacture, modern methods of handling coal and coke, and modern scientific control into works of this size without undue inflation of capital charges. Certain it is that modernization must be faced if these undertakings are to hold their own in the growing competition.

In spite of all the glamour surrounding the popular policy of the electricity industry, there is no need for the smaller gas concerns to be despondent. A little courage and enterprise will remove mountains of doubt. The point to remember is that electricity cannot be generated cheaply on a small scale, whereas gas can. A large gas-works is, in fact, a combination of small ones, as far as gas-making plant is concerned. It is—as Mr. Thomas Hardie recently observed—remarkable how cheaply and efficiently small works can be operated when suitably equipped, so that the difference in working costs between them and the larger works need not be very great.

Courage, however, is needed, particularly in regard to capital expenditure on up-to-date plant. Every gas concern, needless to say, desires to sell gas as cheaply as possible; but the price at any particular moment is not necessarily a criterion of commercial efficiency. An undertaking could, for example, sell gas very cheaply for ten years or so if nothing was put by for maintenance and renewal of plant. What would happen at the end of this period?

Given courage, the question immediately arises of how best to spend the money. A small concern cannot afford to fix a policy for a long time to come on the basis of anticipated revenue which may disappear if a change takes place in the residuals market; and therefore flexibility of the plant installed must be the first consideration. In this regard, the vertical retort shows to advantage. Its operation can within fairly wide limits be modified to suit fluctuations in the prices of residuals; and these modifications need not interfere with the chief essential of gas service—constant gas quality, as measured not only in a calorimeter, but also in a gravitometer. On this matter, Mr. Blundell mentions the emphasis which we have laid on the danger of "indulging" in the use of water gas to meet peak demands.

The author then points out that the stage has now been reached when the skilled attention demanded by the vertical retort is no longer counted a disadvantage. "The controlling element is shifted from the workman to the engineer." Many other features of the vertical retort are dealt with by Mr. Blundell, and he includes in his contribution a series of convincing figures on the cost of gas production in a small vertical installation which has been working for nearly four years. The cost per therm into holder is 1·41d.

## Development of Power Resources.

AN important subject—the development of power resources—has been taken for the Tokyo Sectional Meeting of the World Power Conference, which is to take place from Oct. 30 to Nov. 7, under the Presidency of Baron Koi Furuichi, P.C. A list of 135 papers appears in the official programme; and in due course we shall hope to notice those of them which are of particular interest to readers of the "JOURNAL." They include one by Sir Arthur Duckham, G.B.E., on "The Evolution of the Continuous Vertical Retort;" and another by Dr. A. Parker entitled "Gas Liquor Effluents." Mr. J. E. Lea will deal with the "Volumetric Measurement of Coal and Coke." The programme is complete, with entertainment and excursion arranged on a generous scale.

All papers will be taken as read, with the exception of the general report, which will be read at the opening of each session. The discussions will be confined to the subjects enumerated in the general report, unless the officers consider it necessary to widen the basis of discussion; for only in this way, it is felt, will it be possible to make the meetings of real value, and to concentrate the debates upon matters of primary importance. We would particularly commend the following arrangement, as one well worth adopting: "No speaker will be allowed to "speak more than ten minutes. All speakers will speak "from the platform. At the same time as each speaker "is announced, the name of the speaker to follow him "will also be announced, so that the latter speaker can "take a place on the platform, and be ready to speak when "his turn comes." The official languages are Japanese and English; and a paper submitted in Japanese will be followed by an English translation.

## Gas Dehydration by Brine Solution.

MR. J. E. SPINDLE, General Superintendent of the Grand Rapids Gas Light Company, recently outlined his Company's experience of gas dehydration by washing with a hygroscopic brine solution consisting of sodium thiocyanate and sodium thiosulphate in the ratio of 5 to 1 and having a specific gravity of 1·3. The plant was installed by the Koppers Construction Company under a guarantee that the all-in cost of dehydration would not exceed one farthing per 1000 c.ft. of gas treated, the dewpoint of the dehydrated gas to be maintained at a point 5° Fahr. below the lowest gas temperature observed throughout the distribution system at all times of the year. Recording thermometers are installed for ascertaining what this temperature must be.

The plant, which is located immediately prior to the holder—the latter is of the water-seal type, and an oil

film is employed—consists of a scrubber-tower divided into two sections. In the lower section the gas is scrubbed with the brine solution; while in the upper gas oil disentrains any particles of the solution which may be carried along with the gas mechanically, removes a certain amount of naphthalene, and helps to "lubricate" the gas. A pump, storage tanks for oil and brine, a sump for the latter, and cooling coils and exhaust steam evaporators complete the equipment.

The plant was put into operation just a year ago. The first result of its working was an expected reduction in complaints due to water in service pipes. There was also a gradual diminution in troubles due to rust, and Mr. Spindle is of opinion that dry rust will be easier to remove, and that its effect will be less harmful than wet rust. At the same time, however, blockages caused by dry flaking naphthalene increased in a most disconcerting manner—so greatly that at one period it became necessary to substitute kerosene for gas oil in the upper section of the tower. This treatment was of comparatively short duration, but it has been found desirable to incorporate equipment for spraying oil into the mains at various points. Another noticeable effect was increased leakage from joints due to the drying-out of the yarn, though this difficulty also has been neutralized by the oil-spray.

Better service rather than lower cost is the conclusion drawn by Mr. Spindle as the result of operation of the dehydration plant. The whole question, he maintains, must be regarded from the viewpoint of more perfect service to the consumer. Nothing is of greater worth to the gas industry than the goodwill of its customers, and this can never be obtained if people are subjected continually to pipe stoppages and other troubles which are essentially problems of the gas supplies. "The public is tolerant," he says, "but continued progress can only be expected "from courteous treatment and delivery without inter-"ruptions of a commodity that is free from fault and "uniform in quality." Dehydration is a step in the right direction.

### Autumn Meeting of the Institution.

Mr. C. S. Shapley, the President of the Institution of Gas Engineers, announced last week that the autumn general meeting of the Institution would take place on Nov. 13 and 14, and that on the evening of the 13th there would be a banquet to celebrate the granting of the Royal Charter.

### Use and Abuse of the Telephone.

In an address on "Salesmanship as a Function of Management" before the Annual Conference of the Incorporated Secretaries Association at Cambridge on Sept. 14—an extract from which is published in later columns to-day—Mr. F. W. Goodenough, C.B.E., laid emphasis on the need for careful selection of telephone operators. "A soft answer turneth away wrath," should, he suggested, be printed on a card and hung on every telephone in a business house. An ill-mannered, impatient, hard-voiced telephone operator is an abomination, and should not be tolerated in any office. Good manners alone are not sufficient. The voice that to the customer represents the whole firm and reflects its whole policy ought to be agreeable to the ear, convey immediately the desire to serve, and sympathy with the customer's troubles, and make the customer realize that he or she is regarded as one of first importance whose good opinion and custom the firm values highly.

### British Industries Fair.

Exhibitors and trade buyers alike will find important additions to the arrangements for their comfort and convenience at the forthcoming British Industries Fair, to take place in Birmingham next February. Among the developments for the 1930 Heavy Section is an entirely new building, now in course of construction, on the north side of the present 11-acre Fair. This will comprise a dining-room for exhibitors, another for trade buyers, a large conference hall, and a series of private dining-rooms for the use of the numerous trade and professional societies and institutions which have made it their practice to foregather at the Birmingham display.

### Lounges for Salesmanship.

Two spacious passages, each 72 ft. by 40 ft., connecting the new block with the main building, will be arranged and furnished as comfortable lounges for exhibitors and their visitors; the whole occupying over an acre. The plan of re-arrangement now decided upon has the further advantage of solving—for the present, at any rate—the problem of the ever-increasing demand for space made by exhibitors in the Engineering, Gas, and General Hardware Sections of the Heavy Fair.

### Another Fifteen Acres Secured.

Exhibitors at the Heavy Industries Fair, appreciating the progressive policy of the Birmingham Chamber of Commerce (Inc.) in erecting permanent new buildings to the limits of the original site, will be particularly interested in the announcement that negotiations are practically completed for the acquisition of a further 15 acres of land immediately adjoining—an enterprise which will permit of expansion year by year, as circumstances demand, to an aggregate of nearly one-and-a-half times its present size. Stand lettings in Birmingham for 1930 already beat all previous records; nearly the whole of the accommodation, including the year's extensions, having been booked six months in advance of the opening date—Feb. 17.

### Smoke Abatement.

On Oct. 4, 5, and 6, there will be a joint conference at Buxton of the Coal Smoke Abatement Society and the Smoke Abatement League of Great Britain. The conference will be of exceptional interest, for, in addition to two papers of importance (one by Mr. Samuel Tagg, J.P., Engineer and Manager of the Preston Gas Company, on "The Industrial Uses of Gas, and Their Development"), it will see the birth of a new national organization for combating smoke. As our readers are probably aware, the Smoke Abatement League of Great Britain has in the past confined its attention mainly to the Provinces, while the Coal Smoke Abatement Society has worked chiefly in London. The fusion of the two ought greatly to strengthen the growing movement against smoke, and the step is an important event in the long history of the struggle for the cleanliness of the air. The new body—the name of which will be chosen at Buxton—will have its central offices in Manchester, and will also have offices in London and Glasgow.

### The "Gas Salesman."

There is included with the present issue of the "JOURNAL" the "Gas Salesman" Supplement, which contains, among other matter, the first of a series of articles by Mr. H. Ernest Hunt, on "The Higher Salesmanship." Doubtless the majority of our readers retain vivid recollections of Mr. Hunt's inspiring address before the British Commercial Gas Association at their meeting in York last year.

## FORTHCOMING ENGAGEMENTS.

**Oct. 4.**—NORTH OF ENGLAND GAS MANAGERS' ASSOCIATION.—Autumn meeting at Middlesbrough.
**Oct. 4.**—MANCHESTER DISTRICT INSTITUTION OF GAS ENGINEERS.—General meeting.
**Oct. 5.**—SCOTTISH JUNIOR GAS ASSOCIATION (EASTERN DISTRICT).—Meeting in Edinburgh.
**Oct. 8.**—ILLUMINATING ENGINEERING SOCIETY.—Meeting at 15, Savoy Street, W.C. 2, 6.30 p.m.
**Oct. 9.**—EASTERN COUNTIES GAS MANAGERS' ASSOCIATION.—Autumn meeting in the Holborn Restaurant at 2.30 p.m.
**Oct. 28-30.**—BRITISH COMMERCIAL GAS ASSOCIATION.—Annual Conference at Eastbourne.
**Nov. 13-14.**—INSTITUTION OF GAS ENGINEERS.—General meeting in London.
**Nov. 20.**—SOCIETY OF BRITISH GAS INDUSTRIES.—Autumn General Meeting, Hotel Metropole.
**Nov. 22.**—SOUTHERN ASSOCIATION OF GAS ENGINEERS AND MANAGERS.—General meeting at the Hotel Cecil, Strand, W.C., 2.15 p.m.

## PERSONAL.

Mr. R. W. EDWARDS, Chairman and Managing Director of the Aldershot Gas, Water, and District Lighting Company, has been selected as Mayor of Aldershot for the coming year by an overwhelming majority. He is Chairman of the Health Committee of the Council, and a member of the Works, Finance, and Special Drainage Committees.

At the Annual General Meeting of the North British Association Golf Circle, Mr. GEORGE KEILLOR, of Greenock, was unanimously elected President for the ensuing year, in succession to Mr. James H. Kemp.

Both directors and employees showed their appreciation of and regard for Mr. CHARLES B. CASSELL, Chief Clerk in the Engineering Department of the Portsmouth Gas Company, who is retiring after 53 years' service, at a farewell gathering held in the demonstration room at the Company's offices, Guildhall Square, Portsmouth, on Sept. 19. The Chairman of the Company, Mr. T. H. F. Lapthorn, J.P., who was supported by other members of the Board, presided, and paying tribute to the unstinted loyalty and energy shown by Mr. Cassell during his long period of service, he said he had great pleasure in presenting him with a silver salver and a cheque as a token of the high esteem of the Directors and of their appreciation of 53 years' faithful service. There was a suitable inscription on the salver, under the crest of the Company, and around the inscription the signatures of the Directors were also engraved. Mr. Lapthorn also made a further presentation to Mr. and Mrs. Cassell of a silver tea-set and cheque from the Directors, officials, and employees, and expressed the hope that both Mr. Cassell and his wife would enjoy the best of health in his richly earned retirement. Mr. T. Carmichael (Chief Engineer), in adding his good wishes, referred to the many changes witnessed by Mr. Cassell during his long service. Five chairmen, four engineers, and three secretaries had functioned during the 53 years, and the firm's output, consumers, and finances had all increased approximately ninefold. Nearly the whole of the plant had also been renewed during that period. Mr. H. A. Stibbs (Secretary) and Mr. Savins, for the employees, joined in the sentiments expressed.

The Directors of the Chertsey Gas Consumers' Company, Ltd., have appointed Mr. GEORGE WELLS (formerly Vice-Chairman) as Chairman of the Company, in succession to the late Mr. Frederick Bartholomew.

## OBITUARY.

The death took place on Saturday last of Mr. JOHN STINSON, who was for many years an overseer at the Belfast Gas-Works. After a service extending over 45 years, Mr. Stinson retired in 1924. He was exceedingly popular with all his colleagues, and was aged 73.

## GAS STOCK AND SHARE MARKET.

**[For Stock and Share List, see later page.]**

THE sensational events of last week completely offset the more encouraging signs which were noticeable when the markets opened. At the time of writing full details are not available, but what has transpired will, apart from the fall in values of the shares in the particular companies concerned, have a far-reaching effect on the industrial market generally. One bright spot, however, during the week was the cheerfulness in the gilt-edged market; and with the nervousness about money subsiding on the Bank Rate decision becoming known, there was a general appreciation in prices—War Loan, Conversion and Funding Loans, and Consols Fours all making headway.

Prices in the Gas Market continued in a depressed state, there being no improvements in the ordinary stocks apart from a rise of ½ point in Bristol ordinary at the local exchange. Imperial Continental capital was marked down 30 points to 390-410, while reductions were also recorded in the numerous Wandsworth and Wimbledon stocks; but transactions were normal for the time of the year.

The following transactions were recorded during the week:

MONDAY.—European 16⅛, Gas Light and Coke 17s. 10½d., 18s., 18s. 1¼d., 18s. 3d., 4 p.c. pref. 73⅜, 74, Imperial Continental 417, 420, 422, 425, 426, Liverpool 7 p.c. pref. 101½, Primitiva 34s. 7½d., South Metropolitan 100¼, 100½, 101¾, 6½ p.c. deb. 98½, Sutton 5 p.c. deb. 92, 92½.

TUESDAY.—Alliance and Dublin 96¼, Bombay 17s. 6d., European 16⅛, Gas Light and Coke 18s. 1½d., 3½ p.c. max. 62½, 3 p.c. deb. 56½, 5 p.c. deb. 98¼, Imperial Continental 410, 411, 412, 412½, 413, 414, 415, 416, 417, 417½, 418, Oriental 117¼, Primitiva 34s. 9d., 34s. 9¾d.

WEDNESDAY.—British 116, Cape Town 9½, European 16, Gas Light and Coke 17s. 9d., 17s. 10½d., 18s. 1½d., 4 p.c. pref. 74¼, 3 p.c. deb. 56, 56⅜, Imperial Continental 412, 413, 415, 418, 420, 422, 422½, Metropolitan (Melbourne) 5½ p.c. deb. 99⅜, South Metropolitan 100¼, 100½, 101¼, Tottenham and District 3½ p.c. 106, Wandsworth 4 p.c. deb. 74, 75. Supplementary prices, Swansea 75½.

THURSDAY.—Croydon, sliding-scale, 109½, Gas Light and Coke 17s. 10½d., 18s., 18s. 1½d., 4 p.c. pref. 73½, 74½, 3 p.c. deb. 56¾, Imperial Continental 410, 410½, 412, 413, 415, 417, 418, Liverpool 7 p.c. pref. 102, Plymouth and Stonehouse 5 p.c. std. 112, Primitiva 33s., 33s. 6d., 33s. 9d., 34s., 34s. 1½d., 4 p.c. cons. deb. 81⅝, 81⅞, 4 p.c. deb. (1911), 81⅝, 81⅞, South Metropolitan 99¾, 100, 100½, 100¾, 101, Tottenham and District 3½ p.c. std. 105, 4 p.c. deb. 75¼, 75½. Supplementary prices, Brighton and Hove 5 p.c. deb. 92, British Gas Light, Norwich 3 p.c. deb. 52, 52¼, Cardiff 4½ p.c. pref. 75, Newport (Mon.) 5 p.c. deb. 83.

FRIDAY.—Gas Light and Coke 17s. 10½d., 18s., 18s. 1½d., 4 p.c. pref. 73, 73⅜, 74, 3 p.c. deb. 56, 56¼, 5 p.c. deb. 97½, 98½, Imperial Continental 387, 390, 392, 394, 395, 396, 400, 402, 403, 404, 3½ p.c. deb. 70, Oriental 115½, Primitiva 32s., 33s., 4 p.c. cons. deb. 81½, 4 p.c. deb. (1911) 81½, South Metropolitan 6½ p.c. deb. 98½.

Extremely easy conditions prevailed in the short loan market at the end of the week. Old day-to-day loans were renewed at 4 p.c., and fresh accommodation was available at that rate down to 3 p.c., money being unlendable at the close. Treasury Bills went much as the market expected, the average rate of discount being £5 8s. 11·25d. p.c., which was 9d. p.c. below the average for the previous week. Discount rates were generally lower in consequence.

There were no fluctuations of importance in the Foreign Exchanges. Sterling on New York closed without change at 4.84⅜; French francs appreciated to 123.85; Italian lire to 92.65; and Spanish pesetas to 32.82½. German reichsmarks remained at 20.35¾; Belgas at 31.87½; and Dutch florins at 12.08$\frac{13}{16}$.

No special feature developed in the Silver Market, and the price remained at 23½d. per oz.; Gold being also unchanged at 84s. 11½d. per oz.

The Bank Rate is 5½ p.c., to which it was raised from 4½ p.c. on Feb. 7. The Banks' deposit rate is 3½ p.c., and the deposit rates of the Discount Houses are 3½ p.c. at call and 3¾ p.c. at notice.

**Manchester District Institution of Gas Engineers.**—A meeting of the Association will be held in the Midland Hotel, Manchester, on Oct. 4, at 11 a.m. There will be papers by Mr. Harold Platt, of Bolton, on "Loading and Stresses on Earthworks and Tanks," and by Mr. Leslie S. Pickles, of Halifax, on "The Wet Purification of Coal Gas, a review of past and present methods." Mr. W. B. McLusky, of Halifax, will preside.

**Association of Public Lighting Engineers.**—To correct any misapprehension which may arise from our report in the "JOURNAL" last week of the remarks of Mr. H. E. Copp at the annual dinner of the Association, we publish here his actual words in connection with the subject of lighting: "Although in certain positions electricity may be preferred, gas is generally to be preferred not only for public, but also for private lighting."

**North British Association of Gas Managers.**—In last week's "JOURNAL" we reported in error that the Challenge Bowl in connection with the Golf Competition at St. Andrews was won by Mr. Robert Cairns, of Glasgow, on replay. The winner was Mr. R. L. Laing, of Brechin.

**Industrial Safety.**—The National "Safety-First" Association (Inc.) are this year holding their annual industrial safety congress in Sheffield on Oct. 9. The congress will be held at the Cutlers' Hall, and delegates will be welcomed by the Lord Mayor of Sheffield. The opening address will be given by Mr. Alfred Short, M.P. (Parliamentary Secretary to the Home Office). The Chairman of the congress is Sir Gerald Bellhouse, C.B.E. (H.M. Chief Inspector of Factories), and all arrangements are in the hands of the Sheffield Local Area Committee of the National Association. Full particulars from the General Secretary, National "Safety-First" Association.

# GLIMPSES INTO THE PAST.

## From the "JOURNAL" Eighty Years Ago.

### Gas for Cooking.

Many of our readers in the Midland Counties will recollect the substantial gas-cooked repasts and ingenious lectures with which eighteen or twenty years ago Mr. James Sharp gratified and instructed the public, demonstrating the advantages of these novel applications of gas which he had in his own family practised for several years previous; and it must be gratifying to him to see their value now so generally admitted. . . . We have lately witnessed the celebrated chef of the gastronomic art regaling his guests with a monster joint of 565 lbs. in weight, cooked in an extempore oven in five hours by 750 c.ft. of gas. . . . We have been induced to draw the attention of our readers to this subject from the conviction that therein lies the chief source of the future prosperity of gas companies. With the same mains, and with but slight additions to the apparatus required for the night lighting, a large increase of revenue may be derived, solely by finding full employment for that portion of the capital expended in main pipes, which is dormant and unproductive during twelve hours out of the twenty-four.

### On the Virtues of Advertising.

Archimedes once said that he could move the world, provided he could find a fulcrum for his lever. Modern men of business have found that fulcrum in the columns of the Press. Results, commensurate in their importance with the project of the Syracusan philosopher, have been achieved by a liberal system of advertising. Of the princely fortunes which have been amassed both in London and in the country, how many have owed their origin to a perseverance in advertising by the merchants and tradesmen by whom these fortunes have been raised? By familiarizing the public with his name, and with the quality and prices of the articles in which he deals; by steadily and systematically availing himself of the means of publicity offered by the columns of a journal, the tradesman seldom fails to ensure success, to build up a reputation, and consolidate a connection, of which both himself and his posterity reap a rich reward. A mere enumeration of the metropolitan and provincial firms who owe their present commercial greatness to advertising would fill our columns; and we could mention very many instances, from our personal knowledge and experience, of men who have raised themselves from comparative poverty to affluence through the medium of advertisements. In fact, such is the "go-ahead" spirit of the age, that the man who neglects to avail himself of the auxiliaries offered to him by these important means of publicity will find himself distanced in the race for wealth or distinction by more active, shrewd, and far-sighted competitors, keen to discern and prompt to profit by the advantages offered to them by advertising.

### Alarming Fire at the Dover Gas-Works.

About twenty minutes before six o'clock of Jan. 16 the sky was illumined by a terrific flare of light, which was found to proceed from the Dover Gas Station. Within ten minutes of the alarm, No. 1 of the Corporation engines was on the spot, closely followed by No. 2, and the engine from the Heights, under the direction of Sergeant-Major Kent, and fully manned by a large body of the Royal Artillery, who are ever found ready on such disastrous occasions to render their able assistance. On the arrival of the engines it was intimated that their services would not be required, as, from the flames being confined to an escape of gas, ample means were at hand to arrest the progress of the fire. The flames, however, continuing with unabated fury for nearly half-an-hour, and having communicated to the retort house, the hose of one of the engines was passed over the walls of the works, and, operating upon the spreading fire, speedily extinguished the flames in that quarter, and a subsiding of all further fear of danger soon followed. On an inquiry as to the origin of the fire, we found it to have been occasioned while turning the valve which communicates between the two gasholders. The valve, it appears, works by a crank, and in turning it, when half open, some impediment occurred, when the rush of gas from the aperture ignited from a lamp which was burning close by; the heat was so intense that the lead melted from one of the pipes leading from one of the purifiers, which also became ignited, and caused a most terrific glare, illumining the sky, the reflection of which over the town caused an immense concourse to assemble in a short period, the majority of whom appeared very cautious of approaching too near the premises for fear of the reported "terrific explosion." In less than an hour the flames were entirely subdued, and too much praise cannot be given to Mr. Kirkham, the Engineer of the Works, for the very judicious means employed; nor to his men, for the alacrity with which they executed his orders, many of whom rushed close to the flames, the heat from which was intense, for the purpose of filling the pipes with water. The town on the 19th was in a state of total darkness till the rising of the moon; but we hear that the damage to the works is so trifling that the lamps were lighted on the evening of the 20th.

# NEWCASTLE AND GATESHEAD GAS COMPANY.

## New Garage and Distribution Department Store.

THE NEW GARAGE.

Owing to the necessity for more accessible and commodious premises for the garaging of their motor fleet and the stocking of heavy distribution stores, the Newcastle-upon-Tyne and Gateshead Gas Company decided last year to dispose of their old premises in South Street and erect new premises on a site purchased in Dunn Street, Newcastle, near their Elswick Manufacturing Station.

There was considerable variation in the site levels, involving

the removal of over 6000 tons of excavated material, the demolition of old property, the building of an extensive reinforced concrete retaining wall 22 ft. 6 in. high, and the underpinning of adjacent buildings. All the work was carried out by Messrs. Stephen Easten, Ltd., of Newcastle. The site, amounting to about 3432 sq. yds., is divided into four sections. There is a distribution store 200 ft. long by 48 ft. wide having a total ground floor area of 1067 sq. yds. and in addition overhead galleries. There is a loading dock to take two wagons and a two-ton overhead crane travelling the whole length of the store.

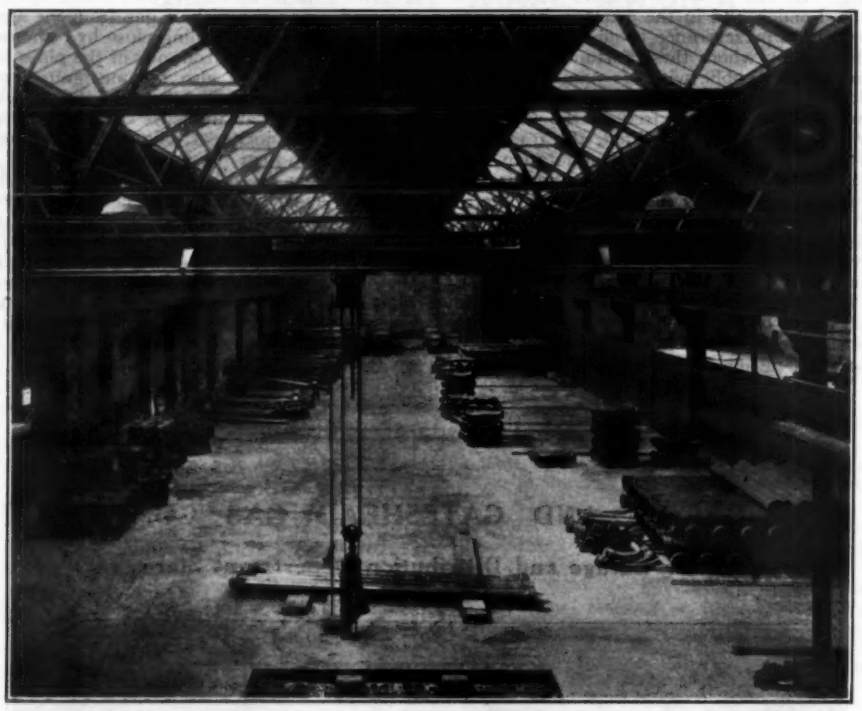
**Main Entrance to the Garage, and East Exterior of Premises.**

The garage extends over two bays, the main building being 197 ft. long by 45 ft. 6 in. wide; and the other bay—which contains office, washing pits, underground benzole storage, and lavatory accommodation—is 64 ft. 6 in. wide by 74 ft. long. The floor area of these two bays is 1526 sq. yds., and there is accommodation for at least fifty motor vehicles. The equipment includes a 16 ft. turntable, vulcanizing plant, power tyre pump, &c.

Advantage has been taken of the varying levels to erect six cottages on the high ground behind the retaining wall; and these afford accommodation for emergency distribution men. The area of this portion of the site amounts to about 839 sq. yds.

The main buildings are constructed in steel, roofed with Robertson's asbestos protected corrugated sheeting; the three gables fronting Dunn Street being in brickwork. The main steel structures were erected by Messrs. Wright Anderson & Co., Ltd., of Gateshead, to designs prepared by Mr. F. P. Tarratt, the Company's Engineer; and the foundations, floors, drainage work, and brickwork walls and gables were carried out by Messrs. Stephen Fenwick & Co., of Newcastle. The latter firm also erected the cottages from the designs of Messrs. Marshall & Tweedy, Architects, Newcastle.

The accompanying illustrations show the main entrance to the garage and east exterior of premises; interior of distribution store; and garage.



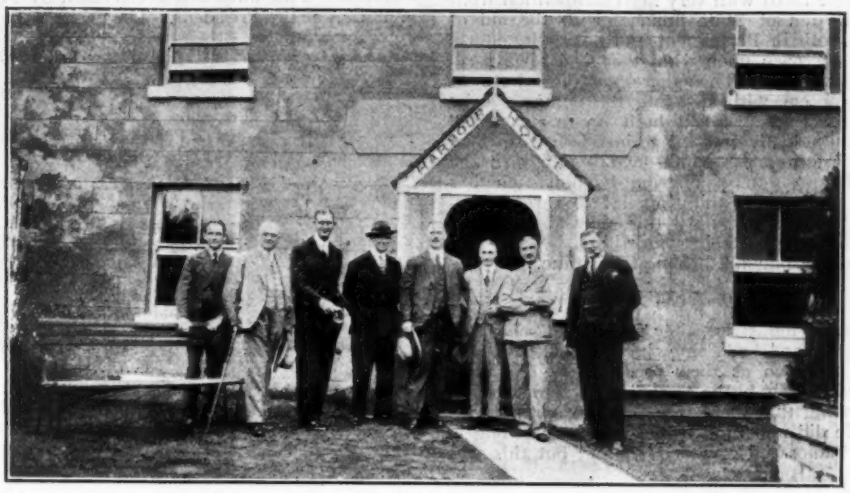
**INTERIOR OF DISTRIBUTION STORE.**

## The North British Association at St. Andrews.

On Sept. 13, the day following the Annual Meeting of the Association, members and their ladies to the number of 60 met at the United College Hall. They were joined by Mr. Geo. Bayne, Architect, St. Andrews, who had kindly consented to conduct the party round the historical places of the city. At the outset, Mr. Bayne gave an outline in brief of the history of the United College. Proceeding eastwards along North Street, the company viewed the town's war memorial, and then went on to visit the ruins of the Old Castle of St. Andrews. They found much there to interest them; and half-an-hour was spent inspecting the Bottle Dungeon, the Well, the Subterranean Passage, and viewing St. Andrews from the Sea Tower. From the castle the party proceeded to the Old Cathedral ruins, and the guide was at much pains to explain its former grandeur. Close by were St. Rule's Tower and Church. From St. Rule's they passed through the Eastern Cemetery, which contains the graves of many men famous in the history of St. Andrews—not least young Tom Morris, the champion golfer, who died in his early twenties! Before proceeding through the Pends, the site of the Old Priory was pointed out and also a portion of the Old City Wall. Proceeding from the Pends, which formed the gateway to the Priory, the Old College of St. Leonards was noticed, and adjoining thereto is a house known as Queen Mary's, where it is believed Mary, Queen of Scots, resided when she came to the old city. The company then came into South Street via the West Port (more commonly "The Port"), the ancient gateway of the city. Passing through "The Port," the party entered South Street, visiting the ruins of the Blackfriars Friary, and finally the Parish Church, dedicated to the Holy Trinity. The opportunity was also given to members to visit the Chemistry and Physics Laboratories of the University.

# WALES AND MONMOUTHSHIRE DISTRICT INSTITUTION OF GAS ENGINEERS AND MANAGERS.

## GENERAL MEETING AT PORTHCAWL.



A large attendance of members faced the Retiring President, Mr. FRANK BOARDMAN, of Cardiff, when the proceedings were opened in the Council Chamber, Porthcawl, on Wednesday last, Sept. 18.

Councillor J. M. WALTERS, J.P. (the Chairman of the Porthcawl Urban District Council), extended a hearty welcome to the members. He said that, although the Council had at the moment almost decided upon an electric lighting scheme, they were greatly interested in the gas industry through being owners of the local undertaking. They were, in fact, considering means of increasing the efficiency of gas production at their works, which went to prove that they had every faith in the future of the gas industry. The Council owed a great deal to their Gas Manager, Mr. Walker, who had had to carry on under considerable difficulties.

Council R. S. HAYES, J.P. (the Chairman of the Gas Committee), and Councillor W. J. GRIFFIN (the "father" of the Council) associated themselves with the welcome.

Mr. BOARDMAN, in acknowledging the reception, mentioned that they had with them Mr. C. S. Shapley (the President of the Institution of Gas Engineers) and Mr. Ross Taylor (of the National Gas Council). He extended to both a cordial welcome, and asked them to address the meeting.

Mr. C. S. SHAPLEY remarked that it gave him great pleasure to find himself among so many old friends. He would like to say how greatly all the members of the parent Institution appreciated the fact that they had now a Royal Charter, which added lustre to their great industry. There would be strict entrance examinations, which would be all to the good; and he hoped that the chairman of both company and municipal undertakings would see to it that young men of the right type coming along were adequately equipped to seek promotion to the high offices of the industry. All engineers, too, must use every endeavour to ensure adequate remuneration to the juniors. Some of the salaries which they saw advertised in the Technical Press were, in his opinion, far too low, and would not be likely to attract the class of man they hoped to secure. He acknowledged the great amount of good work that had been done by Mr. H. D. Madden as President of the Institution, and by the members of Council elected to represent South Wales. Everyone remembered what Cardiff had done; and all the members would look forward to the day when their esteemed friend Mr. J. H. Canning followed in the wake of Mr. Madden.

### REVOLUTIONARY CHANGES.

Alluding further to the parent Institution, Mr. Shapley said he could take credit for the introduction of two revolutionary changes. The first of these enabled every member of the Institution now to become a potential candidate for the Presidency. He had put forward a resolution to the effect that the expenses of holding the annual reception should no longer fall upon the shoulders of the President or of his undertaking; and now it was open to every member who was efficient, and who took a real interest in the industry, to occupy the chair. The second thing was the inauguration of an autumn meeting. The dates fixed for the first of these were Nov. 13 and 14; and the Council had decided to have, on the evening of the 13th, a banquet to celebrate the granting of the Charter.

### THE CHARTER AND THE INSTITUTION.

Speaking of the recent meeting of the North British Association, at which he was present, Mr. Shapley alluded to the motion that was introduced to change the name of the Association to the Institution of Gas Engineers of Scotland. The proposal, he said, was debated at considerable length; and in the end it was agreed that no change should be made, so that the name of the Association remained as before. To him it seemed that a happy solution would have been the Scottish Association of Gas Managers; but he was most anxious that anything he said should not be taken in the wrong way. He was asked his views, but he was not in a position to speak officially, because, as President of the Institution he had made it a matter of policy never to speak on any debatable or contentious point without first consulting the members of his Council. He could therefore only express his private opinion, which was that they were treading on dangerous ground. Having regard to the fact that the Institution had now obtained a Royal Charter, he would like to put forward the suggestion that the Wales Institution—and the same thing, of course, applied to the Manchester Institution—should fall into line with the other District Associations, by modifying their title so that the word "Institution" should be the prerogative of the parent body.

As to the Secretaryship of the Institution, Mr. Shapley stated that there had been 602 applications, which had been gradually reduced; and on the previous day the Council had met and interviewed the final candidates. The thinning-out of the list had involved an enormous amount of work; for they had been exercised to secure a man of the highest possible qualifications for the position. He mentioned the matter now, so that the members should not think it had been neglected. No doubt, after the next Council meeting on Oct. 9, there would be a statement to make to the Press.

### COST OF GOOD PUBLIC LIGHTING.

He was sorry, Mr. Shapley went on to say, to learn that the Porthcawl Urban District Council were so misguided as to contemplate the lighting of their streets by electricity. It would, no doubt, cost a lot of money to substitute electricity for gas, which was already there. They would be wasting the ratepayers' money in doing this, when they could get all they wanted by adopting modern gas lanterns, keeping them clean, and spending a little more on light. There were comparatively few authorities who were at the present time spending enough on street lighting. He did not consider that anyone ought to pay less than an 8d. rate, which was that levied in Leeds and Glasgow. It was not too much, and anyone who attempted to light the streets for anything under an 8d. rate could not give satisfaction. Of course, there was an electrical "boost" on, and the papers were full of it; but, with proper maintenance, gas could give completely adequate service.

The HON. SECRETARY (Mr. Octavius Thomas, of Pentre) pointed out that nothing could be done in the way of alteration of name without due notice of motion.

### IMPORTANCE OF CO-OPERATION.

Mr. ROSS TAYLOR explained that he was present at the meeting because neither of the Joint Managers of the National Gas

Council was able to attend. It was sometimes felt in London that they were not in sufficiently close touch with the Provinces. This was true; but there were so many organizations up and down the country, and such a multiplicity of work to be got through, that it was difficult to attain the ideal. It was a great pleasure to come to South Wales, for from no part of the country was greater assistance and more loyal support received than from Wales; and this was a time when co-operation between the units of the gas industry was of the greatest importance. They were faced with very keen competition from electricity. With the aid of State finance, with the aid of State advertisement, both in Parliament and out of it, efforts were being made to encroach upon what they had always regarded as their own preserves. Then there was the coke oven industry, who, not content with invading the domestic coke market, which the gas industry had built up over a great number of years, were actually wanting to interfere with them in the matter of their primary product—wanting to turn the gas industry into the position of distributors only, whether they liked it or not. The same thing applied to various bye-products, of which tar was one. All this showed that they must present a solid front to their competitors. Never was the need for union more pronounced than at this time.

### THERE MUST BE NO WEAK LINKS.

If they looked at other industries, they found that some had re-organized themselves, and had come through. Others who thought they could carry on as their predecessors had done were now fighting with their backs to the wall. He was not for a moment suggesting that there was anything wrong with the gas industry. He did not think it had ever been stronger, or that union in its ranks had ever been closer; but this was no reason for not making this union stronger, and there were many ways in which it could be done. They had an Institution which was encouraging investigation and research—always endeavouring to find better methods, thus increasing efficiency and bringing down costs. Then there was the question of amalgamation, joint working, giving and taking of bulk supplies. Difficulties might arise. There were local jealousies, vested interests, and heaps of things to combat; but it must be borne in mind that inefficiency in any one unit would gradually react upon the whole. This was what made it so important that everybody should secure the maximum efficiency. They wanted the very best, so that people all over the country would say: "Gas is the thing for us."

### MEMBERSHIP ROLL.

The minutes of the last meeting having been read and confirmed, Mr. J. Harold Williams, of Cardiff, was elected a member.

### THE NEW PRESIDENT.

Mr. BOARDMAN then introduced the new President, to whom he wished all success, in the assurance that he would acquit himself well.

Mr. BARTON GRAINGER, of Caerphilly, then took the chair, amid hearty greetings, and proposed a cordial vote of thanks to the outgoing President. Mr. Boardman, he said, had every reason to feel proud of his year of office.

Mr. H. D. MADDEN (Cardiff), seconding the vote, said that all in Cardiff knew the sterling worth of Mr. Boardman. During his (the speaker's) year as President of the Institution of Gas Engineers, Mr. Boardman put his back into things, in order that work which they had in hand should be accomplished and everything made presentable for the visit which followed. It was a pleasure to take this opportunity of publicly thanking Mr. Boardman for this.

The PRESIDENT next presented the medallion of the Institution to Mr. Boardman, as a memento of his year of office; and Mr. BOARDMAN suitably acknowledged the gift.

### PRESENTATION OF PRIZES TO THE JUNIORS.

The net item on the agenda was the presentation of prizes to members of the Wales and Monmouthshire Junior Gas Association. This duty was undertaken by Mr. Shapley, on the invitation of the President. The prizes were as follows:

*For having passed Grade III. Examination in Gas Fitting, Cardiff Technical College.*

H. M. Vodden, Cardiff.
G. Blake, Cardiff.
H. G. Fundell, Cardiff.
R. R. Brown, Cardiff.

*For having passed Grade II. Examination in Gas Fitting, Cardiff Technical College.*

B. E. Davies, Cardiff.
A. G. Blake, Cardiff.
W. D. Evans, Cardiff.
H. C. Vaughan, Cardiff.
J. Good, Cardiff.
A. C. Baldwin, Cardiff.

*For having passed Grade I. Examination in Gas Fitting, Cardiff Technical College.*

S. Arrowsmith, Cardiff.
S. C. Rooker, Cardiff.
B. T. Lloyd, Cardiff.
G. B. Humphries, Cardiff.
R. J. Parker, Cardiff.

A. R. Blight, Cardiff.
E. A. Whiller, Cardiff.
R. Francis, Cardiff.
D. G. R. Davies, Cardiff.
J. MacKendrick, Cardiff.

*For work done for the Wales and Monmouthshire Junior Gas Association.*

C. B. Felton, Newport.
J. Hislop, Newport.
Kelvin Jones, Newport.
Terence H. Madden, Cardiff.
J. W. Thomas, Bristol.

*For having passed Grade III. Examination in Gas Fitting, City and Guilds of London Institute.*

W. Bannister, Newport.
J. H. Betts, Newport.
E. W. Smalldon, Newport,
T. E. Wiltshire, Newport.

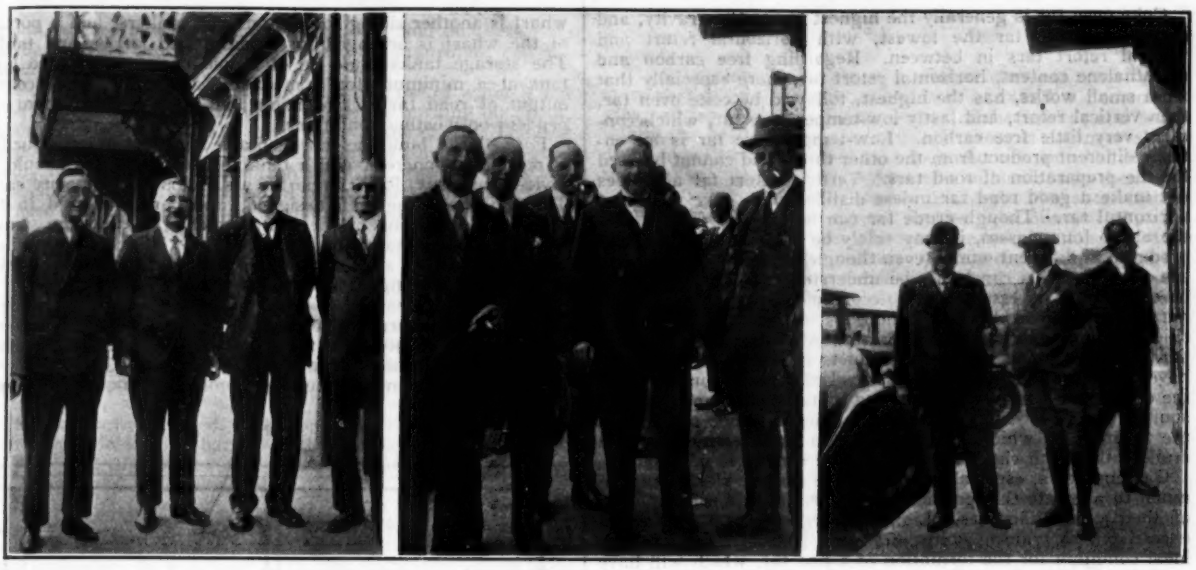
*For having passed Grade II. Examination in Gas Fitting, City and Guilds of London Institute.*

J. J. Asquith, Newport.
T. F. Edwards, Newport.
W. F. Garraway, Newport.
L. J. Hewinson, Newport.
L. C. Vickery, Newport.

*For having passed Grade I. Examination in Gas Fitting, City and Guilds of London Institute.*

W. Connor, Newport.
D. G. L. James, Newport.
L. J. Price, Newport.

Mr. SHAPLEY said he took a great interest in the Juniors; and he thought this plan of prize-giving was one upon which all present were to be congratulated. To the Juniors he would say: "The success of the gas industry very largely depends



upon you. Your loyal co-operation with the management in your various walks of life will tend greatly to the harmonious working of the industry. Pull together with those above you."

REPRESENTATIVE ON THE PARENT COUNCIL.

On the proposition of Mr. J. PROSSER JONES (Caerphilly), seconded by Mr. J. MOGFORD (Cardiff), Mr. Barton Grainger was appointed to represent the Institution on the Council of the Institution of Gas Engineers for the year commencing in June, 1930.

SPECIAL PURPOSES SECTION.

The nineteenth annual report of the Special Purposes Section, which was signed by the Chairman (Mr. James E. Kenshole), stated that two meetings had been held since the last report. The membership was now thirty—ten local authorities and twenty companies. All undertakings were urged to join the British Road Tar Association. Attention was drawn to the fact that the Institution of Gas Engineers have revised the Education Scheme; and in this connection the hope was expressed that Managers would give every assistance and encouragement to their assistants and juniors. The receipts for the year amounted to £44 17s. 6d., and the payments to £38 13s. 9d., leaving with the balance brought forward, the sum of £26 10s. 7d. in the hands of the Treasurer, together with £300 of 2½ p.ct. Consols.

The report was adopted, on the motion of Mr. H. BARKER (Llanelly), seconded by Mr. W. CLARK JACKSON (Neath).

NOTES ON ROAD TARS.

Mr. G. E. CHILDS (Ferndale) afterwards read some "Notes on Road Tars." These, with a report of the discussion which ensued, follow.

The author was accorded a hearty vote of thanks, on the proposition of Mr. W. H. JOHNS (Swansea), seconded by Mr. W. COLLIN (Bridgend).

THANKS TO THE COUNCIL.

Moved by Mr. J. H. CANNING (Newport), and seconded by Mr. R. J. AUCKLAND (Cardiff), the Porthcawl Urban District Council were thanked for the use of the Council Chamber for the meeting.

The place of next meeting was left to the Council to decide.

Thereafter a party of 85 sat down to luncheon in the Esplanade Hotel, with the President in the chair. Mr. Shapley proposed "Prosperity to the Town of Porthcawl," and this was responded to by Councillor Griffin. The toast of "The Wales and Monmouthshire Institution was submitted by Mr. Ross Taylor, and acknowledged by the President.

The afternoon was spent by many members on one of the two neighbouring golf courses; and during the day a number took advantage of a warm invitation to visit the Pirates' Club, where the welcome extended to them belied the name. Half ship, half haunt, the Pirates' Club of Porthcawl is an intriguing place. A jolly time was spent there; and memory of the visit will linger. The accompanying snapshot shows the clubhouse; but only one or two of those standing outside are Pirates.

GOLF COMPETITION.

On the following day, the Institution's golf competition was played in glorious weather on the Royal Porthcawl Golf Links. The following were the best scores:

| | | |
|---|---|---|
| E. W. King ... | ... | 92 – 18 = 74 |
| S. C. Whitfield | ... | 96 – 20 = 76 |
| R. R. Bird ... | ... | 90 – 12 = 78 |
| R. J. Auckland | ... | 83 – 4 = 79 |
| C. S. Shapley | ... | 99 – 19 = 80 |
| W. Clark Jackson | ... | 84 – 4 = 80 |
| B. Grainger ... | ... | 98 – 18 = 80 |

# NOTES ON ROAD TARS.

By G. E. CHILDS, of Ferndale.

## [Paper before the Wales and Monmouthshire Institution.]

At the present time much attention is being focussed on tar and the preparation from it of suitable material for use in the construction and maintenance of our roads. There can be no doubt that the reason for the prominence of this subject is that the tar, which for so many years has been of substantial help to the revenue of gas undertakings and selling itself at fairly high prices, has now fallen in price and is only with difficulty disposed of.

There are many reasons for this, but the chief reasons are, first, the increase in production due to increased sales of gas and the number of coke ovens and allied carbonizing plants which have been put into commission in this and other countries during recent years; secondly, the slump in the patent fuel market, with consequent decrease in the use of pitch; and thirdly, keen competition from foreign bitumen and asphaltic materials used in road construction. This competition is being successfully combated and is being made a national question. There is every reason to believe that rock bottom has been reached in the price of tar and that it is now steadily on the up-grade.

The use of tar for road construction is a very old practice. Crude tar was used formerly, and no doubt in those days gave satisfaction. To-day, no gas engineer should allow crude, or so-called "dehydrated tar," which has had a portion of its water removed by decantation, to be sold for road construction or even spraying. This cannot make a road fit for the heavy traffic duties of to-day and will not aid in obtaining a recommendation for the use of properly prepared tar.

NATURE OF TAR.

Crude tar as obtained from the distillation of coking coals may be roughly classified by the type of carbonizing apparatus from which it is produced:

(*a*) Coke oven tar.
(*b*) Horizontal retort tar.
(*c*) Vertical retort tar.
(*d*) Low-temperature tar.

These classes differ materially from one another in specific gravity, phenol and naphthalene content, and also in the so-called "free-carbon" content.

Coke oven tar is generally the highest in specific gravity, and low-temperature tar the lowest, with horizontal retort and vertical retort tars in between. Regarding free carbon and naphthalene content, horizontal retort tar, more especially that from small works, has the highest, followed by coke oven tar, then vertical retort, and lastly low-temperature tar, which contains very little free carbon. Low-temperature tar is an entirely different product from the other three, and cannot be used for the preparation of road tars. Vertical retort tar also does not make a good road tar unless distilled with coke oven and horizontal tar. Though crude tar can be roughly divided into the above four classes, it may safely be said that no two tars produced at different works (even though the same coal be used) are similar. This can easily be understood when it is remembered that tar is essentially a decomposition product, and its nature determined by the conditions of manufacture. The chief influences are the temperature of the carbonizing apparatus over which the tarry products in the form of vapour have to pass, and the velocity of travel of these vapours. Thus the distiller at a tar works receiving its tar from many different sources has to face the problem of a varying crude product, to the solution of which and guidance in the treatment of the crude a thorough chemical and physical control is necessary.

Gas engineers, especially those at the smaller works, can do much to alleviate this position, at the same time solving some of their own difficulties. Lightly charged retorts worked at excessive temperatures with attendant back-pressure give an ideal condition for the formation of a bad tar, which will have a high content of free carbon and naphthalene, and a high percentage of water in a more or less emulsified state, very difficult to separate by settling and steam heating. If this tar gets to the stills, not only is it difficult to produce a good road tar from it, but trouble will be experienced in frothing and boiling-over of the charge, causing much unpleasantness and extra work.

The above conditions set out for the production of bad tar are also helpful in the formation of naphthalene and other objectionable pitchy deposits in the condensers and works mains, and, if not finally abstracted from the gas before leaving the works, in the district mains and services as well.

It is the writer's experience that the deposition of naphthalene, &c., in condensers and scrubbers has been almost completely avoided by strict attention to the charging of the carbonizing apparatus.

Again, too rapid cooling of the vapours in the first condenser affects the nature of the tar, as well as helping in the formation of deposits in that part of the plant. Cooling should always be gradual.

I hope you will not misunderstand me in this, and think I am advocating that the gas engineer should devote his energies to getting ideal conditions for tar production at the sacrifice of efficient manufacture of his main product—gas—as this is not my intention; but I nevertheless maintain that by attention to one or two simple details, which will help rather than hinder the manufacture of gas, a better crude tar could be produced at most of our works, more especially the smaller ones.

### Laboratory Control.

To produce a good road tar and to see that the quality and particular properties are maintained, strict control from the laboratory is absolutely essential. To facilitate the distillation process all foreign crudes (if these are being worked) must be carefully sampled and tested for water, &c. Again, a sample of each charge to the stills should be taken, and a distillation test made upon it. The stillman will be in a position to know from the information obtained what precautions are necessary, and will also be enabled to tell, with a fair degree of certainty, how each still should be fired. This will mean a saving of time and fuel.

The use of graphs and similar diagrams is very helpful in this respect (as they are in many other processes). They are more easily understood than a batch of figures. More important from the sales point of view are the tests on the consignments of prepared tar. Only by continuous and strict testing is it possible for each user to obtain the tar with the exact qualities he requires, and also be sure that one consignment does not vary from another. Again, if a user finds that the particular tar is not what he requires, it is an easy matter, by reference to the records of tests, to make a tar more suitable for his purpose. It is by attention to the above that tar users can be satisfied, and kept satisfied, which means that they will maintain, if not increase, their purchases.

### Lay-out of Plant.

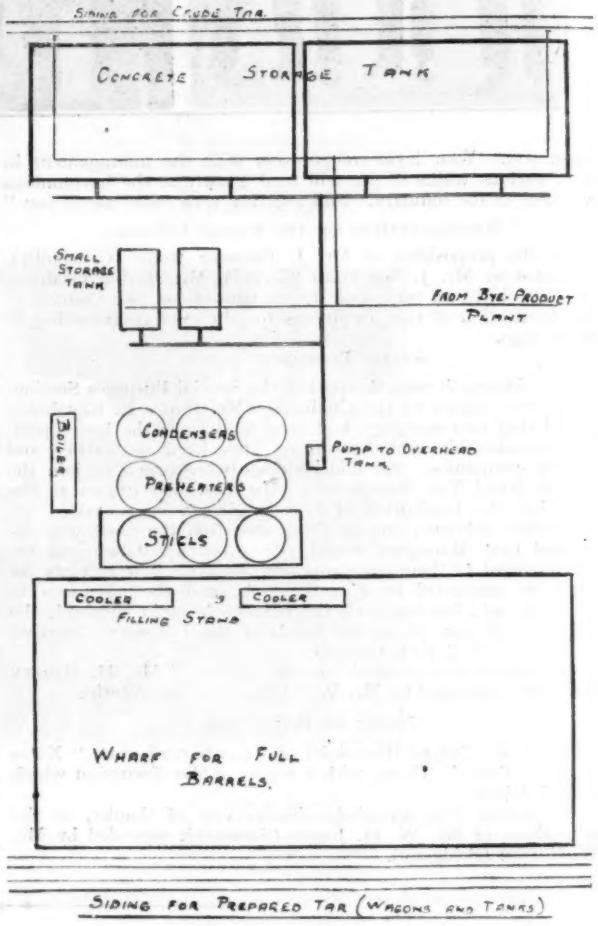
The most suitable site for a tar distillery is on the slope of a hill, when as much use as possible can be made of gravity flow for the movement of tar, and a saving of steam in pumping effected.

At the highest part of the site, the siding for full tankers should be placed; next the large storage tanks; then smaller iron tanks for steaming and the primary heating. Next the stills with overhead storage tank, preheaters, condensers, &c., and then, on the lowest level, the cooling tanks with filling and loading wharves should be situated. Running alongside the wharf is another siding for wagons and tankers, and a portion of the wharf is arranged for loading road lorries and tanks. The storage tanks must be of ample capacity, 1000 to 2000 tons at a minimum for a medium sized distillery, since the output of road tar is seasonable and to a certain extent dependent on weather conditions.

For a large tank the most suitable material of construction is reinforced concrete, and a tank to hold 2000 tons should be divided into (say) four compartments of 500 tons capacity each. The tank must be well designed, and care exercised in the filling and emptying of the compartments, so that the strains on the tank are maintained fairly equally. Each compartment is equipped with steam coils for warming the tar, ensuring separation of entangled water and ease of flow.

A considerable saving of time in movement of tar is made if the tar is kept warm by steam coils at every convenient point, and this also greatly helps the separation of water, which gives a saving of time and fuel in the final distillation.

In the accompanying rough plan of the lay-out of a small




General Lay-out of Tar Distillery.

distillery with three 15-ton pot stills, it is seen that tar from railway tanks and also from the bye-product plant storage tank can be conveyed either into large storage tanks or direct into the smaller storage tanks. By this means during any rush period the tar from the bye-product plant, which is of constant constitution and of low water content, can be taken direct to the smaller storage tanks and the stills. Any tar arriving in rail tanks which is of a suitable nature can also be run direct to these small storage tanks ready for distillation.

The small storage tanks may seem unnecessary, but in working there are many uses to which they can be put, and they prove an invaluable aid. Here, the tar is well heated by steam coils, and any liquor in suspension separates out. This liquor, of course, collects as a layer on top of the tar and is removed and returned to the bye-product plant, where it is treated in the sulphate factory.

From the storage tanks, the tar is pumped to an overhead tank, and then run into the preheaters for charging the stills. The refined tars are run out from the bottom of the stills through the outlet cock into cooling tanks, from which the barrels are filled by means of flexible metallic tubes, or direct into railway tanks or road tankers.

It is essential for the rapid handling of barrels that the loading wharves should be kept clean, and, to facilitate this and for easier handling, the wharves are fitted with raised rails of light

section, spaced to take a barrel on its roll, and on these rails the barrels are stored if there is not an immediate call for loading.

In case of a small fire on a tar plant, the use of water is not to be recommended, as it tends to splash the burning tar about, causing the fire to spread to other parts of the plant. The best method is to smother the fire with damp sawdust, and a good supply of this should be kept on hand. Large pieces of wet sack cloth are also very useful in this respect. By careful use of these methods, quite large fires can be soon put under control and extinguished in a short time.

### Operating.

An outline of the operation of distilling 140 tons of tar per week in three 15-ton pot stills is given below. This is, of course, not the maximum capacity of the plant, but the following arrangement enables prepared tar to be produced at a low cost.

Five men are employed, with the occasional use of an extra man to help in loading barrels and other odd work. One stillman is required, with two men for filling and loading barrels, one cooper, and one spare hand.

The stills of refined tar, which have been marked for barrelling, are run out early on Monday morning by the stillman, who then proceeds to pump tar to the overhead tank, to run the tar from preheaters to still, and to fill the preheaters again from the overhead tank.

The fillers load up any wagons with full barrels that are required, and arrange the empty barrels on the filling stands, by which time the tar in the cooling tanks is ready for filling. This operation is then proceeded with, the filled barrels being either run direct into wagons or stored on the wharf. Two men can fill and dispose of 150 barrels each day.

Towards the end of the shift, the stillman lights small fires, which are attended to occasionally throughout the night by a spare hand from the bye-product plant, and, by the morning, the tar has been brought to such a temperature that the water and light oils are slowly distilling off. The stillman then takes on the firing, and, working to his instructions or following a diagram prepared for the particular batch of tar, completes the distillation, which, in most cases, is over in six to eight hours. The firing in the first stages must be steady and light until the well-known signs of boiling and the change in colour of the distillate confirm the laboratory diagram, and indicate that it is safe to force the fires and bring the tar up to the required stage for the desired product.

During the distillation, sulphurous fumes are given off, and catch boxes are installed for the removal of these, which must undergo purifying treatment before being allowed to escape into the atmosphere. After the water has been removed, the light oils coming over will contain naphthalene, and it is necessary to heat the water in the condensers by means of a steam jet; also the pipe conveying the distillate to the settling tank should have a steam pipe running through it, so that the naphthalene is prevented from solidifying and blocking up the pipe.

The distillate in the settling tanks is allowed to stand, and the water run off. The naphthalene settles out, and the oil is drained off. The naphthalene is then placed on to draining trays ready for subsequent treatment.

The control of the operation is by means of a thermometer in the take-off to the swan-neck outlet from the still. This method is to be preferred to the method of control in which the specific gravity of the distillates is utilized. Different qualities of tar are obtained by stopping the distillation when a certain temperature has been reached, and also by taking the still up to a temperature and firing in such a manner that this temperature is held for a definite time. This latter procedure varies the consistency of the tar with as little loss as possible.

The empty barrels, on unloading, are all examined by the cooper, who classifies them for re-use or repair. A barrel should do four or five journeys without repair, but the barrels on the road are generally subject to much rough handling, which shortens their life considerably. The barrels for re-use are cleaned, and the ends painted and stencilled, or labelled by the spare hand, and those for repair are burnt to remove any tar and chippings adhering to them, and repaired by the cooper, when they are again painted and stencilled, and are all ready for filling. Care must be taken that the barrels for filling do not contain any water or light oils, for, when the tar is run into them, the water, &c., will boil up, throwing the tar out of the barrel and, maybe, burning the filler.

These operations are continued on alternate days, with the exception of Sundays, which is reserved for any special repairs, cleaning, and other work which might be necessary.

Under this method of operation, the total cost for all labour would be about £17 10s. per week. The fuel used is coke breeze or washery slurry at 5s. per ton, and the quantity 30 tons per week, which is sufficient for distilling and steam raising, and the operating cost at full output of 140 tons per week would be about 2s. 6d. per ton, and fuel costs a little over 1d. per ton.

When the tar plant is run in conjunction with the bye-product plant, supervision and laboratory work can be done by the bye-product staff, so that little extra cost is entailed on this respect.

There is generally in the immediate vicinity of most works, more particularly the smaller and medium sized, a demand for prepared tar equivalent to the output of the works; and before selling the crude tar to the distillers, the gas engineer should decide whether or not it would be a more favourable proposition to distil the tar at the works on similar lines to the above.

By judicious advertising and a display at the showroom, a demand could easily be created for the light oils and naphthalene produced. The light oils could be sold as a preservative for wood, especially for outside work such as garden fences. The naphthalene, well crushed and mixed in proportion with lime, is one of the best destroyers of garden pests and weeds, and a market could be created for this among the local gardeners and allotment holders. Even ammoniacal liquor as produced without any treatment is a good fertilizer, but care and knowledge must be exercised in the use of this.

### Specifications.

The Ministry of Transport has issued two general specifications for road tar for the guidance of surveyors. One of these is for spray tar and the other for tarmacadam, and it is generally demanded that prepared tar supplied falls within the limits of these specifications. Limits are set for specific gravity, water content, distillate below 170° C., distillate between 170° C. and 270° C., and between 270° C. and 300° C.

Also, the maximum content of phenol, naphthalene, and free carbon is specified, together with the viscosity range.

The reasons for these limits are as follows:

(1) Water present in suspension is harmful, as it lessens the adhesive power of the tar, when it is very easily washed off by rain. Again, when tar containing water is put into the road heaters and fire put under, the tar froths up and boils over, and, even with careful heating, it is almost impossible to avoid this.

(2) Light oils (below 170° C.) present in the tar are the primary cause of complaints. On warm days these are brought to the surface of the road and create an objectionable odour.

(3) Phenols present beyond the limit specified tend to break up the coating and give off vapours poisonous to the surrounding vegetation.

(4) Naphthalene up to the limit given helps in making the tar plastic, but if too much is present the carpet of tar is rendered porous and less able to withstand wear.

(5) Free carbon in excess tends to make the tar coating brittle, but up to the limit given it acts as a filler. Too little free carbon is worse than too much, and many tars containing free carbon beyond the specified limit are giving good service.

Though the tar produced by the distiller may come within these specifications, it does not follow that it satisfies the requirements of the user in every respect.

It is in these cases that the testing referred to previously proves of service and enables a special treatment to be devised for preparation of the required tar. The visit of a representative from the tar distillery to the place where the tar is used is always advisable, as, by his advice, the difficulties may be surmounted at the user's end, and satisfaction given in that manner.

### Barrels.

The conveyance of tar in barrels is costly and unsatisfactory, for many reasons, and wherever possible, their use should be avoided, and the tar conveyed in tank lorries to the macadam plants or the spraying machines on the road. By this means the time lost in running the tar from barrels (especially in cold weather) and also the fuel necessary to reheat the tar are saved.

The need for this is greater for macadam plants; and in the case of small plants, and where no tank lorry is available, suitable arrangements can be devised whereby one of the small storage tanks at the macadam plant can be loaded on to a lorry and taken to the distillery for filling with hot tar, and then returned to the macadam plant and used while still hot.

For spraying, a later development is a motor driven spraying machine which can be filled with hot tar and sprays half the width of the road as it moves along. This does away with hand spraying, and an economy in labour is effected.

There are in use a large number of continuous distillation plants and also special types of plant for the distillation of tar, but, generally speaking, these are not as useful as a pot still for a small distillery making varying products, though economy in fuel and labour is claimed for them and is, no doubt, effected.

The underlying purpose of this paper is to describe roughly the preparation of road tar, and to seek opinion as to whether

or not it would be more profitable for isolated small and medium sized works to distil their make of tar and market the products in their own district.

### Discussion.

Mr. R. R. BIRD, who was called upon, said that, as a tar distiller, he was in a rather peculiar position to discuss the paper. There were, however, one or two points which he was glad to see emphasized by the author. The first of these was that the practice still prevailing in many districts of putting crude tar upon the roads was to be deprecated. The bad name which tar had got in some quarters had no doubt been due to its use in the crude state. It was important that gas engineers should realize that, if they were to fight successfully the competition that was being experienced from bitumen and proprietary compounds generally, use must be made of a really first-class article. It was only by careful attention to the preparation of the material which was to be put upon the roads that they could hope to compete successfully. The other point, which really went with the first, was the importance of strict control from the laboratory of the distillation process.

#### PUBLICITY.

Mr. H. D. MADDEN (Cardiff) said the paper was opportune, and it was gratifying to think that one of their new members had come forward and given it. Tar was closely in the mind of the gas man at the present time; and as Chairman of the various Tar Committees in South Wales, there were one of two points which interested him. The first was the question of price. The author stated that there was every reason to believe that rock bottom had been reached in the price of tar, and that it was now steadily on the up-grade. It all came back to the rationalization of the tar distilling industry. It was by working together that the best results could be attained; but in addition to this individual publicity was essential. The author suggested that showrooms should display the various products of tar. The Cardiff Gas Company did this; and they also exhibited at various shows the derivatives from the distillation of coal. This had helped them considerably. It was publicity and co-operation that would put tar on a better footing. Sometimes tar got a bad name, not through its own fault, but because of contractors who did not intimately mix the materials. He had had one or two cases in which the trouble was of this nature. Then when the tar was put down according to the Company's advice in regard to mixing, the next section of road was perfectly satisfactory. By joint effort, they might put up in small tins carbolic materials, disinfectants for home use, made from tars in that district.

#### RESULTS OF CO-OPERATIVE EFFORT.

Mr. C. S. SHAPLEY pointed to the big effect of the price of tar upon the net cost of coal. He said he was not sure as to the wisdom of small or medium sized undertakings making prepared tar. ["Hear, hear."] They had experienced great trouble in the West Riding of Yorkshire through small units trying to produce specification tar; and the whole of the tar—with the exception, he believed, of one works, Halifax—was now dealt with in the West Riding on the co-operative basis. Better prices were obtained, and they were certain that correct specification tar was being put on the roads.

#### A FUTILE POLICY.

Mr. R. G. SHADBOLT remarked that, as he had been called upon, he would like to voice one thought that had been passing through his mind—that the main lesson to be drawn from the paper was the futility of the great majority of undertakings in this country attempting to distil their own tar. The size of plant illustrated in the paper was infinitely larger than the bulk of gas undertakings could find tar to work. If this was the minimum size for economical working, they could prove to their own satisfaction that in most cases the plant could not possibly be employed profitably by gas undertakings. The great majority of the gas-works were below 100 million c.ft. in annual output. Compare the tar they would produce with the amount required to work this plant, and they would realize how the matter stood. They should leave the distillation of coal tar to persons who had had most experience of this work.

#### MISTAKES OF THE PAST.

Mr. J. H. CANNING (Newport) said mistakes had been made in the past, and wise people learned from mistakes, and took care not to repeat them. One of the mistakes made by some sections of the industry was to supply crude or imperfectly prepared tar for the surfacing or making of roads. There was no doubt whatever that a great deal of the bitumen competition from which they now suffered, and the displacement of tar by bitumen in various places, had been due to this. They must comply with specifications which would give the utmost satisfaction to road users and road engineers. Another mistake of the past had been to take in some instances too much advantage of temporary market conditions. Road engineers were compelled to have the tar; but a permanent sense of grievance was left behind, and when bitumen appeared on the scene it was looked upon as a saviour. They had to live this down. While they should receive a fair market value for their product, they should endeavour to maintain a standard price which was remunerative but as far as possible free from fluctuation.

#### NON-SKID PROPERTIES OF ROAD TAR.

There was, Mr. Canning continued, one point which he thought should be repeatedly emphasized in regard to the use of tar for roads, and that was its non-skid properties. There were some roads upon which various other compounds had been used where skidding was a daily occurrence—especially after slight rain. With a tarred road, this skidding could be entirely eliminated; and in connection with what Mr. Madden had said regarding publicity, he thought the most possible should be made of this point. Again, in that district, and in the other coalfields, it should always be remembered that tar was a home product—a British product made from coal mined by their fellow countrymen. It was a most extraordinary thing that, at any rate in Glamorgan and Monmouthshire, where the public bodies were composed so largely of those engaged in the mining industry, bitumen should be extensively used, and their own home product be greatly neglected. He did feel that every representation possible should be made, both to the local authorities and to the Government, to secure as far as possible the use of British tar on British roads.

#### EXPERIENCE AT SWANSEA.

Mr. W. H. JOHNS (Swansea) remarked that he was glad Mr. Shadbolt had been called upon, because he had to a great extent cleared the air. He had expressed an opinion—and, after all was said and done, the object of the author was to obtain an opinion—as to whether it was preferable for gas undertakings to distil their own tar or to sell it to distillers. He had not been experiencing the difficulty to which Mr. Canning had referred, with regard to foreign materials being put upon the roads. In West Wales they had been successful in obtaining most of the contracts for tar on the roads. Up to now Swansea had not thought it was to their advantage to join the co-operative tar scheme. He did not think there were many gas undertakings in the country which did distil their own tar. Generally speaking, this was done only by the very large gas-works. The paper was an excellent one; but it was more applicable to those connected with the coke oven industry than to gas engineers. His own opinion with regard to the question with which the author closed his paper was that the distilling of tar was not a profitable proposition for any small undertaking. In order to make a tar plant a profitable proposition one must instal, not only crude tar distillation apparatus, but subsidiary plant for dealing with various run-offs, which the ordinary gas undertaking was not in a position to provide because of the capital expenditure involved. In this way only could the products be marketed to the best advantage. He must express disagreement with the view of the author regarding the inadvisability of gas engineers undertaking dehydration. In Swansea they had found it was a most paying proposition. They were in a position to dehydrate a very large percentage of their tar, for which they were able to obtain a very favourable price. He would like to stress the point that tar obtained from horizontal retorts was a much better product than any other tar available for road purposes. At Swansea they had only horizontal retorts; and this was one of the factors which influenced them in installing such plant in their peculiar position. It was very encouraging for them to learn from a gentleman who had been connected more or less all his life with coke ovens and tar distilling work that such tar was more welcome than that obtained from other systems. Horizontal men, therefore, felt that they should demand a better price for it.

Mr. J. MOGFORD (Cardiff) pointed out the necessity of bearing in mind that the administration of the roads would very soon pass to the bigger authorities, so that they would have to deal with county surveyors, and not, as hitherto, with local surveyors. This, to his mind, would increase the difficulties of the small man. In the future tar would have to be sold in bulk to the large authorities, which would practically eliminate the market for any peculiar tars turned out by the smaller men.

Mr. CHILDS, in the course of a brief reply to the discussion, remarked that the tar from large horizontal retort installations was always welcome. Sometimes there were bad things said about the tar from smaller works.

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**A New Use for Mews.**—The West End of London is changing rapidly in character—even Mayfair is being invaded by shops which sell anything from French frocks to Italian cars. Residential space is harder to find every day—and yet the district is not by any means less attractive to the private resident. The person with limited means who wants to live in that area nowadays turns his attention to the small houses situated in mews at one time connected with the larger property on to which they back. The lower parts of the houses have, many of them, long since been converted into garages, but their upper floors are now being remodelled and formed into well-appointed flats. An interesting example of what can be done with these small and frequently old houses is given in the current issue (No. 186) of "A Thousand-and-One Uses for Gas." It shows how a professional woman converted an old tailor's workshop, which on first sight appeared to be almost uninhabitable, into a charming little town flat for two. A copy of this book, which shows what the interiors were like before the conversion, and the pleasing transformation made afterwards, can be obtained free of charge on application to the Secretary, the British Commercial Gas Association, 28, Grosvenor Gardens, S.W. 1. It should be of interest and practical use to all who have in hand the remodelling of old property.

# SALESMANSHIP A FUNCTION OF MANAGEMENT.

By F. W. GOODENOUGH, C.B.E.

**[From an Address on "Salesmanship as a Function of Management" before the Annual Conference of the Incorporated Secretaries Association at Cambridge on Saturday, Sept. 14]**

I have taken for the subject on which to address this important body of business men that of "Salesmanship as a Function of Management," because I regard it as essential that the business men of this country to-day should realize first of all the fundamental importance of salesmanship to commerce and industry, and the vital importance to the nation at this juncture in its history of an improvement in our methods of salesmanship; and in the second place the fact that salesmanship is a function of the entire business organization, and must be a primary concern of the management, from the chairman through every rank of the executive.

After remarking that the great need of British trade at this juncture in our national history is increased efficiency in the marketing of the products of our factories and workshops, and that scientific selling is the essential complement to scientific production and scientific management, Mr. Goodenough proceeded: The selling policy of a firm determines its success or its failure. Whether its selling policy makes for success depends first and foremost upon its being firmly and clearly based upon right principles, and then upon the consistent and persistent and thorough application of those principles to every detail of its relations with its customers.

One of the greatest difficulties of management is that of securing that right principles are always applied in the right spirit by every individual employee of a firm. Employees are much too prone to take a narrow view of what are really the true interests of the firm. They are too keen to "make a bit extra" when the chance arises, too ready to see an immediate advantage which may well result in an ultimate far greater loss—namely, the loss of the confidence of the customer who finds he has not had a square deal. And these tendencies need very careful watching and correction by the management.

The essential principle of commerce is that it shall be conducted not as a contest between men out to best each other, but as a form of mutual service for the reasonable profit of both parties; and that the seller shall direct all his energies to winning the enduring satisfaction and confidence of the customer by always carefully studying his point of view and his circumstances, so as to serve his best interests skilfully and well; seeing things from his side of the bargain; and meeting his needs and wishes in every reasonable way.

### OUR CUSTOMERS SHOULD BE OUR FRIENDS.

The root principle of this statement is that the success of all business depends ultimately upon the friendship and confidence of the customer. Accepting the truth that people deal most willingly with those they feel most friendly towards and put most confidence in, we get to further vital considerations. People feel most friendly towards and put most confidence in those who take trouble to get thoroughly to know them and their needs and wishes, their customs and habits, and then proceed to supply their needs and gratify their wishes most completely, satisfactorily, and punctually at a reasonable cost; and who, further, are ready at all times promptly to remedy faults of service or to modify designs of goods or methods of service to meet the customer's changing needs or tastes. This is no light specification of basic principle. It needs faith, determination, courage, and vigilance on the part of the management to see that it constantly animates policy, procedure, and detailed behaviour.

### SALESMANSHIP IN THE OFFICE.

Consider what it means from the point of view of management so far as that is concerned with the office, and especially the secretary and his staff. The indoor staff of a firm can do much to help the salesman on the road or in the showroom to increase turnover. They can also—alas they often do—discount the best efforts of the best salesman by mishandling his customers, just as the factory can by carelessness, negligence, and delay. There are several ways in which the office can display good, bad, or indifferent salesmanship and so increase the success or hasten the failure of the business.

The principal ways in which the office comes in contact with the customer are by correspondence, by telephone, and by interview; and these are of special importance when they relate to the rendering and collection of accounts or to the handling of complaints.

### USE AND ABUSE OF THE TELEPHONE.

An ill-mannered, impatient, hard-voiced telephone operator is an abomination who should not be tolerated in any office; but it is not enough that whoever answers a customer on the telephone, either first or last—and how much too often there are many stages to be gone through before the customer gets attention from a person competent to deal with the business!—it is not enough that the "respondent" should have ordinarily good manners. The "voice" that to the customer represents the whole firm and reflects its whole policy ought to be agreeable to the ear, convey immediately the desire to serve, and sympathy with the customer's troubles, and make the customer realize that he or she is regarded as one of first importance whose good opinion and custom the firm values highly. "A soft answer turneth away wrath," should be printed on a card and hung on every telephone in a business house. Every telephone operator should be selected with as much care and for the same qualities as a B.B.C. Announcer, and everyone who speaks to a customer on the telephone should try to be an "Uncle Rex" or an "Aunt Sophie."

### IMPORTANCE OF CORRESPONDENCE.

And so with correspondence. The impression which every letter should convey, though not in any stereotyped language or commercial jargon, is that of desire to serve and to satisfy. It is always of importance to remember that the reader of a letter cannot divine motives or intentions unless they are fully and unambiguously conveyed by the written word. He knows no more of his correspondent's mind or of the facts of the case than is clearly expressed in the letter, which must always be written so as to be read through the reader's spectacles, and "the other man's point of view" must always be taken fully into account.

### INTERVIEWS PREFERABLE.

The difficulty of getting letters written always in this spirit and with this regard for the effect it will produce on the mind of the reader makes it especially important to avoid correspondence over matters in dispute, and especially over complaints and claims, whenever it is possible to substitute personal interview for correspondence.

### COMPLAINTS.

I particularly regard the treatment of complaints as "the acid test" of salesmanship—or of service, whichever word you choose to use. They are, or ought to be, interchangeable. If the complaining customer is regarded at best as a nuisance, at worst as an enemy, and certainly as a vexation, there is something radically wrong with the policy of the firm. It is clearly not based on sound principle. Every complaint, if it is to result in the ultimate satisfaction of the customer, must be regarded, at any rate in the first instance, as being probably well founded.

In my experience, in dealing with a large number of customers of all ranks for over twenty years—they now number well over a million—complaints are very rarely entirely unfounded. They may be, they often are, due to misunderstanding—as are nine quarrels out of every ten; but the misunderstanding is, as often as not, caused by our failure to convey our meaning or intentions lucidly, completely, and without ambiguity to someone who cannot be expected to know the technicalities of our business, or to realize our intentions by intuition, or to appreciate our policy unless it is made clear to the uninitiated. It is, therefore, merely stupid of us, and very unhelpful, to get annoyed with a customer for what is more than half our own fault.

The fact is, not that the British customer complains too often and without cause, but that he does not complain as often as those whose guiding principle is service would wish him to do. Customers' complaints are too rare rather than too frequent. Some people will nurse a grievance for months or even years rather than take the trouble to grumble and have it out with you.

### "THE CUSTOMER IS RIGHT."

But, given the complaint, the only way in which to demonstrate the sincerity of your desire to give true service is to start with the idea that "the customer is right"—at any rate, that he genuinely believes himself to have a grievance—to probe fearlessly and honestly into the cause of his dissatisfaction; to be absolutely honest in owning up to your fault, if fault there be; and to be generous beyond justice in making good any loss and inconvenience and annoyance the customer may have sustained. Then you will be rewarded by earning his gratitude and regaining the confidence you have temporarily forfeited.

I think I have said enough—though I could say a great deal more on this subject; for instance, on the collection of accounts and the great importance in that connection of very close liaison between the salesman and the counting-house—to make good my point that salesmanship in the widest and truest sense of the word is a direct and vital concern of management, and that unless the selling policy of a firm is built on the rock of Service to the Customer, and unless every act and thought of everyone employed in it is animated and governed by that principle, the firm cannot progress as it might and should.

# VERTICAL RETORTS FOR SMALL WORKS.

By J. E. BLUNDELL, Engineer and Manager to the Carlisle Gas Department.

**[Paper before the Cumberland and Westmorland Gas Managers' Association, Sept. 25.]**

The Cumberland and Westmorland Gas Managers' Association came into being chiefly owing to the difficulty experienced by the managers of this district, arising from its geographical position, in attending the meetings of the North of England Gas Managers' Association or other District Associations.

When meeting in this district, it is natural that we should address ourselves to the consideration of the position of the smaller gas undertakings, of which there are several examples in the Counties of Cumberland and Westmorland—undertakings with an annual make of from 25 to 60 million c.ft., and which already feel, or very soon will feel, the keen competition of electricity under the new schemes of regional supply, or what is popularly known as the "grid system." Including Grange-over-Sands, which, though actually in Lancashire, lies within the natural limits of the area under consideration, we should have a list something as follows:

| | Annual Make in Million C.Ft. |
|---|---|
| Cleator Moor | 28·5 |
| Cockermouth | 45 |
| Egremont | 27 |
| Keswick | 36·6 |
| Millom | 43·3 |
| Whitehaven | 39 |
| Grange-over-Sands | 28 |
| Windermere | 31·3 |

Speaking without any regard to the circumstances of any particular case, it may be said that the problem is how to introduce modern methods of gas manufacture, modern methods of handling coal and coke, and modern scientific control into works of this size without undue inflation of capital charges. Certain it is that modernization must be faced if these undertakings are to hold their own in the growing competition of which we have spoken; and it is equally certain that it would be most in the spirit of the times to turn first to ideas of grouping and amalgamations. While we had our objections to the financial and administration measures by which the grid system was brought into being in the electrical industry, and while we still object to the totally unnecessary pledging of public credit in this direction, we are prepared to admit that this system is best adapted to the exigencies of the electrical industry. But it does not by any means follow that the same or similar measures would be equally efficacious in the case of the gas industry.

## TECHNICAL EFFICIENCY.

The popular mind is convinced that grouping and amalgamation result in a higher efficiency. Now there are two kinds of efficiency, which we may call technical and commercial. The technical efficiency of a gas undertaking will be measured by the thermal efficiency of the gas-making process or by the number of therms made per ton of coal carbonized considered in relation to the production of bye-products. But it by no means follows that technical efficiency will be increased in proportion to the size of the works. There is this difference between the gas-making process and the generation of electricity. In the latter, high technical efficiencies are only realized in very large units kept running under a favourable load factor. No doubt one of the most important reasons for this is the difficulty, if not the impossibility, of storing electricity—a disability under which we do not suffer in the gas industry. In some of the super-stations now in operation the whole of the load is carried by one or two units. Nothing like this state of affairs obtains in the gas industry. The unit of production, whether you take the individual retort or the retort setting, never carries anything but a small fraction of the load. And large units can be kept in constant operation over long periods, during which the variation in load is slow and readily predictable. Provided, therefore, that the demand for gas is of such magnitude as will keep a modern unit of gas-making plant fully employed over most of the year, there is no reason why a gas-works using three or four such units should not reach a technical efficiency as high as that of the large works, which is, speaking generally, merely a multiplication of similar units. Though the units in the larger works may be of greater capacity, they will not generally be more efficient technically, nor will their efficiency be in any way affected by the total demand for gas. That is to say, provided the small works is sufficiently large to be equipped with modern carbonizing plant, and provided that the plant is controlled with the same scientific ability as that displayed in the large works, there is no reason why the small works should not equal the large undertaking in technical efficiency.

## COMMERCIAL EFFICIENCY.

Commercial efficiency is another matter. The rough-and-ready way of expressing it is the price per therm. At first sight it might be thought that when the cheapest possible therm has been produced, the limit of commercial efficiency is reached. While, however, this may be true at any particular time, such a criterion requires modification if regard is also had to the safety of the commercial position of the undertaking in the future. This safety is not attained until the sale of the maximum number of therms per head of population in the district served, and in the districts which ought to be served, is reached. When the demand of the population for gas for all purposes has been worked up to the maximum, and that demand satisfied at the cheapest possible price, having regard to the cost of capital, labour, and raw materials, then, and then only, is the undertaking in a sound and safe position.

It is obvious that if any portion of this demand remains unsatisfied there is an opening left for the exploitation of electricity, which, when once established, may be difficult to dislodge, particularly in view of the popular and political appeal of the regional supply schemes and the super-power stations, which when once erected must be kept under load even at a financial sacrifice.

In order to ascertain whether modern carbonizing plant of any type can be applied to the development of the works of a particular undertaking, it will be necessary to draw up a balance-sheet. Often the consideration of such a balance-sheet will show that the adoption of modern methods, after allowing for enhanced capital charges, will give no immediate increase in revenue. The justification for a change, for example, from hand-charged horizontal retorts to vertical retorts may have to be sought in advantages from the point of view of ready extension, economy of ground space, facilities for control, and saving in labour, rather than in increased revenue from residuals. It is not proposed to attempt to construct a typical balance-sheet for the small works. The conditions are so variable that such a hypothetical case would be of no value. Each case must be considered on its merits, and in view of the whole of the attendant circumstances.

Assuming, however, that the balance-sheet has been drawn up, it is important to bear in mind certain fundamental principles when coming to a decision based upon it. In the first place, it can be very confidently laid down that the important items are those which are independent of market fluctuations. It is of very little use going ahead with a scheme which is going to fix the policy of the undertaking for a long time to come on the basis of anticipated revenue which may disappear on a very slight change in the prices realized for the secondary products.

Certain items will remain absolutely or relatively constant. These are the costs and prices of coal, gas, labour, and capital charges. Such variations as do occur in these charges will automatically balance themselves, or must be made to do so artificially. The position of coke, tar, and ammonia is very different. These are bye-products which must in any case be disposed of whether their prices be high or low, and yet these prices are subject to rapid and wide variations. Many a coke heap has been disposed of at prices very much lower than those which figure in the estimated costs of production. Tar may become for a time almost a drug on the market, and it is some years since sulphate was anything but a doubtful asset, at any rate in the smaller works, or since liquor could be disposed of at anything better than a slight loss.

On the other hand, the coal bill must always be met, the cost of labour is fixed for relatively long periods ahead, the remuneration of capital can be accurately foretold, and the revenue from gas will always be at least proportionately realized.

The first principle, therefore, for the estimation of the prospects of success is that the estimate should be based mainly upon the proceeds from the sale of the principal product—namely, gas. "Therms per ton of coal carbonized" is, from this point of view, relatively more important than coke available for sale, yield of tar, and gallons of liquor produced, though it is not for a moment suggested that the latter items can be neglected. They may, however, be outweighed by such collateral economies as the very considerable saving that often can be made in the transport charges of the much less weight of coal required for a given production of gas in such modern apparatus as the continuous vertical retort.

We cannot do better here than quote the following passage from Mr. Thomas Hardie's recent address to our parent Association. He said that "the development of the vertical retort has placed even small works in an excellent position as regards the cost of gas-making." And he went on to say that "it is remarkable, indeed, how cheaply and efficiently even small gas-works can be operated when suitably equipped."

The continuous vertical retort seems to offer by far the best solution of the problem we set out to consider—namely, how

to procure for the small works those advantages in the handling of materials, improvement of labour and management conditions, and technically higher efficiency, which are available for the larger works. That the problem can be solved in this way is shown by the following list of some of the works with an annual make from 25 to 60 millions per annum where continuous vertical retorts have been successfully installed.

*British Isles.*

[Small Works with Continuous Vertical Retorts.]

| — | Annual Make in Millions. | | — | Annual Make in Millions. | |
|---|---|---|---|---|---|
| | At Time of Installation. | Latest Returns. | | At Time of Installation. | Latest Returns. |
| Alva | 31 | .. | Inverness | .. | 67·0 |
| Ballymena | 24·8 | 49 | Irvine | 59 | 60·5 |
| Bangor | 52·8 | 192 | Innerleithen | .. | 24·5 |
| Brechin | .. | 51·2 | Kilsyth | 39 | 60·5 |
| Burntisland | .. | 43·6 | Kinlochleven | .. | .. |
| Carnoustie | .. | 47·2 | Lanark | 34 | 49·9 |
| Cupar | .. | 52·0 | Lochgelly | .. | 51 |
| Crieff | .. | 42·0 | Lurgan | 48 | 68·2 |
| Denny | 30 | 61·2 | Maryport | .. | 75 |
| Dundalk | 39 | 43·5 | Montrose | 54 | 72·7 |
| Dunoon | 49·5 | 90 | Newmarket | .. | 64·6 |
| Earby | .. | 42 | Peebles | .. | 54·8 |
| Ely | .. | 42·5 | Portadown | .. | 51 |
| Formby | .. | 58 | Skegness | .. | 72 |
| Fraserburgh | .. | 42 | Seaford | .. | 66 |
| Haddington | .. | 23·6 | Troon | 52 | 65·5 |
| Holywood | 28·8 | 56·5 | Wexford | 53 | 61·5 |

We may advantageously examine some of the considerations which no doubt influenced in greater or less degree the decision to adopt the vertical retort in the foregoing instances. In the first place, it may be safely stated that continuous vertical retorts will, in every case, occupy much less ground space than the equivalent horizontal retorts; and this in many instances is sufficient to enable extensions or renewals of carbonizing plant to be made without increasing the area required for gas-works purposes. Such increases in area are often particularly difficult to obtain in this district. In many cases, too, the continuous vertical retort has enabled reconstructions of plant to be made, and extensions to be carried out on the original site, which otherwise would have necessitated the removal of the entire works to a new site.

### Further Virtues of Vertical Retorts.

An even greater point in favour of the adoption of the continuous vertical retort wherever possible in the small works is the possibility of taking advantage of the Gas Regulation Act without incurring the troubles arising out of fluctuating gas composition. The seriousness of these troubles is not always realized by those who have not experienced them. Where a small water gas plant is used to meet sudden demands for gas, the difference in specific gravity may be as much as 20 p.ct. less when the water gas plant is in operation than when the gas is "stretched" by longer periods of intermittent carbonization or by "pulling"—practices which must be resorted to where steady conditions cannot be maintained for want of necessary and suitable plant. Now as the pressure in a given main (other factors being unaltered) is directly proportional to the specific gravity, it follows that the pressure may vary by the same amount, causing trouble and complaints in the district.

Often the small undertaking has to supply gas for industrial purposes. If so, the question of unvarying composition is still more important.

In a recent leading article in the "JOURNAL," strong emphasis was laid upon the danger of "indulging" in the use of water gas to meet peak demands. "An industrial gas appliance must be designed according to the type of gas which it will burn, and, after adjustments have been nicely made, the composition of the gas supplied to the apparatus must not vary." There are examples, particularly in the textile industry, where uniform length of flame is vital, and this is affected not only by composition but by pressure. It is obvious, therefore, that methods of production which facilitate the maintenance of constant composition and constant pressure in the district are in every case to be preferred if complete satisfaction to the consumer is to be attained.

The difficulty, in any case, of keeping constant conditions in horizontal retort carbonization is one which demands the closest personal supervision of the manager. The composition and quality of the gas is affected by many factors which can be varied by the stoker, and which must be attended to by him. The weight of the charge must be regularly watched. Variations to a considerable extent are possible in every charge. Stopped pipes are a frequent source of trouble, demanding skilled attention at short notice. And much may be said of the naphthalene bugbear. Most of these factors are automatically checked, controlled, or abolished in the continuous vertical retort. Once the manager has adjusted the conditions to the requirements, nothing that the stoker is likely to do, short of neglect of easily understood instructions, will cause considerable variations in the gas quality. The controlling element is shifted from the workman to the engineer. We have now reached the stage at which the skilled attention demanded by the vertical retort is no longer counted a disadvantage. The facts are, of course, that the vertical retort responds to skilled attention to a far greater extent than the horizontal retort, and that skilled attention can produce results and efficiency which are quite beyond the attainment of the horizontal retort in practice, particularly in the smaller works.

There used to be an idea abroad that the manager of a small works had less demands upon his ability as a carbonizer than had his brother of the large works. The exact reverse is, of course, the case. The manager of the small works must attend personally to all the technical details of his works and his district, in addition to the commercial side of the business. It is therefore doubly necessary that, if he is to realize the efficiencies possible with modern apparatus, this should be given to him in such a form that he can readily get the desired results without arduous labour and without undue personal engagement in routine.

This paper would hardly be complete without some attempt to show at what cost gas can be produced in the small works with continuous vertical retorts, and the writer submits an estimate drawn up in a recent instance in this district where continuous vertical retorts are now under construction, together with a statement of actual costs realized in an instance where the retorts have been in operation for nearly four years.

### *Estimated Cost of Production of Gas in an Installation of Continuous Vertical Retorts.*

DATA.

| | |
|---|---|
| Annual make | 74 million c.ft. |
| Gas made per ton | 20,000 c.ft. |
| Coal carbonized per annum | 3700 tons |
| Coke sold based on 8 cwt. per ton of coal carbonized | 1480 tons |
| Stoker's wages | £4 os. 11d. per week |
| Handyman's wages | £3 5s. 11d. ,, |
| Price of coal | 19s. per ton |
| Selling price of coke | £1 1s. 8d. per ton |

EXPENDITURE.

| | £ s. d. | £ s. d. |
|---|---|---|
| Coal, 3700 tons at 19s. per ton | | 3515 0 0 |
| Labour— | | |
| £4 os. 11d. × 52 × 3 | 631 3 0 | |
| £3 5s. 11d. × 52 × 1 | 171 7 8 | |
| | | 802 10 8 |
| | | £4317 10 8 |

RECEIPTS.

| | £ s. d. |
|---|---|
| From coke, 1480 × 21s. 8d. | 1603 6 8 |
| ,, tar $\frac{15{\cdot}9 \times 3700 \times 11 \times 35s.}{2240 \times 20}$ | 505 11 0 |
| | £2108 17 8 |

| | £ s. d. |
|---|---|
| | 4317 10 8 |
| | 2108 17 8 |
| Cost of production per annum | £2208 13 0 |
| Cost of production per therm at 450 B.Th.U. | 1·6d. |

(74 millions at 450 B.Th.U. = 333,000 therms per annum.)

### *Cost of Production of Gas in an Existing Installation of Continuous Vertical Retorts.*

DATA.

| | |
|---|---|
| Annual make | 61·166 million c.ft. |
| Gas made per ton | 19,340 c.ft. |
| Coal carbonized per annum | 3161·4 tons |
| Coke sold based on 6·9 cwt. per ton of coal carbonized | 1091·6 tons |
| Stoker's wages | £3 8s. 11d. per week |
| Handyman's wages | £2 12s. 6d. ,, |
| Price of coal | 19s. 2½d. per ton |
| Selling price of coke | £1 os. 6d. ,, |

EXPENDITURE.

| | £ s. d. | £ s. d. |
|---|---|---|
| Coal, 3161·4 tons at 19s. 2½d. per ton | | 3037 3 0 |
| Labour— | | |
| Stoking and coal and coke handling, £3 8s. 11d. × 52 × 3 | 537 11 0 | |
| Oiling (one-third time), 17s. 6d. × 52 | 45 10 0 | |
| | | 583 1 0 |
| | | £3620 4 0 |

RECEIPTS.

| | £ s. d. |
|---|---|
| From coke, 1091·6 × 20s. 6d. | 1119 9 6 |
| ,, tar $\frac{19{\cdot}62 \times 3161 \times 11 \times 69s. 6d.}{2240 \times 20}$ | 1060 19 3 |
| | £2180 8 9 |

| | £ s. d. |
|---|---|
| | 3620 4 0 |
| | 2180 8 9 |
| Cost of production per annum | £1439 15 3 |
| Cost of production per therm at 400 B.Th.U. | 1·41d. |

(61·166 millions at 400 B.Th.U. = 244,666·4 therms per annum.)

Members will be able to compare these figures with data in

their own possession and see what the effect would be of the adoption of similar plant in any particular case. It will be noted that the cost of maintenance is omitted in both instances, so that the two cases are strictly comparable. In both examples the declared calorific value has been fixed, as it nearly always must be, not by the limitations of the carbonizing plant, but by the exigencies of existing mains, services, quality of gas demanded, and coal supplies available.

### AMENITIES.

Apart, however, from economy of gas production, reliability of service, facility and flexibility of operation, there are further considerations which strongly recommend the continuous vertical retort in such a district as that in which we are meeting. If the gas industry is to make good its claim that it has a complete solution of the problem of the smoke nuisance of the domestic chimney, it cannot in these days countenance the installation in a residential district of carbonizing plant characterized by the emission every few hours of large volumes of smoke and steam. These inevitable accompaniments of intermittently charged retorts are in themselves an intolerable nuisance. The contrast between these older systems and the new is a remarkable one. The continuous vertical retort is a closed system. Instead of the unavoidable clouds of smoke and steam involved in the process of charging and discharging, the coke issues from the retort ready quenched and dry. The coal falls automatically into the retort from a closed hopper placed above it and in direct communication with it, and the gas passes away imperceptibly in a constant stream of practically unvarying composition. And the whole process is controlled by the adjustment of the speed of coke extraction (effected by a simple mechanical device), of the proportion of steam admitted to the retort (effected by the operation of a simple, though specially constructed, valve), and the adjustment of the temperatures of the setting to the requirements of the coal and the quality of gas which it is desired to produce. Instead of the noisy, dusty handling of large bulks of coal and hot coke at frequent intervals, there is a constant stream of coal to the retort and a constant flow of gas, coke, tar, and ammonia from it.

It is useless protesting against a disfigurement of the natural beauties of the Lake District by the standards and trestles of electricity supply if the gas industry are going to deface the sky with smoke nuisance from the gas-works. The continuous vertical retort can be installed in any residential district without appreciable detriment to the amenities of the neighbourhood.

In conclusion, I express the hope that this paper will be helpful to engineers of small works when considering the reconstruction of carbonizing plant. I suggest, also, that at future meetings members should contribute short practical papers for discussion. I feel sure that there are many subjects upon which members would like to compare notes. By throwing our experiences into the common pool we may materially assist each other and make this Association a useful agency in the improvement of the gas industry in this district.

# CARBONIZING PLANT AT THE DAWSHOLM GAS-WORKS.

By J. FRED. HARRISON, M.Inst.C.E.

**From a Paper before the North British Association of Gas Managers, Sept. 12.**

In 1927 a contract was concluded with the Woodall-Duckham Company, Ltd., for the construction of two benches, each of 22 ten-ton continuous retorts, and two benches each of 24 four-ton vertical chamber ovens, with the relative coal-handling plant.

The run-of-mine coal normally used varies in size from dust to large lumps, and has to be broken before being elevated to the storage hoppers. Breaking produces more fines, and, since Scotch coals do not usually cake, much small breeze is produced; also the fines fill the interstices between the larger pieces of coal in the retorts, and prevent the free escape of the gases from the retorts. To rectify these two sources of loss, the fines of 1 in. and under are removed from the broken coal; they are washed, dried, mixed with caking slacks, disintegrated, and carbonized separately in the chamber ovens.

Further to enhance the value of the chamber coke, it is cooled in a Sulzer plant without the use of water. The result is an excellent semi-metallurgical coke, quite dry and low in ash, worth 20 to 25 p.ct. more than ordinary coke on the carbon basis.

Coal over 1 in. is carbonized in the continuous retorts.

The gas from the chambers varies from 520 to 550 B.Th.U., and that from the continuous retorts is varied in quality to give an average gas of standard calorific value. One bench of 11 continuous retorts and one bench of 12 chamber retorts have been connected to each of the two foul mains, thus forming two separate units of 300 tons carbonizing capacity.

The two streams of gas pass through separate water-tube condensers and unite at the exhausters. The water-tube condensers are in two batteries of five chambers, each with gas and water regulation. Thermometers are provided at the inlets and outlets of both gas and water, the latter being metered. The tar and liquor from all the branches run to a separator, from which the liquor is circulated to the gas offtakes in the usual way, and the tar flows to the tar well.

### COAL HANDLING PLANT.

The plant required to handle the coal from the trucks to the retorts of the carbonizing plant is naturally more complex and extensive than is usually associated with a retort house, especially as some of the coal has to be washed. A description of the process was published in a paper by Smith and Finlayson in the "JOURNAL" for May 1 last. The plant used is a rotary tippler over a receiving hopper provided with a regulating device called a "sure feed," which delivers the coal over a 3-in. "grizzley" to a coal breaker. Both the grizzley and coal breaker discharge on to an inclined shuttle band conveyor, which delivers (1) to a 1-in. grizzley, to extract the fines for the washery, and thence to the rotary feeder of the gravity-bucket conveyor supplying the coal charging hoppers over the retorts; or (2) directly to the gravity-bucket filler, if shuttled forward.

The fines from the 1-in. grizzley are taken by another band conveyor and bucket elevator to a Hummer screen, which denudes the fines of particles under ⅛ in. and passes the remainder to the feed-hopper of the washery.

The raw coal, approximately 1 in. to ⅛ in. in size, which has passed over the Hummer screen is received in a buffer bin, from which it is continuously fed by a revolving table with discharge knife at a predetermined rate into a trough. There it meets a stream of water from the circulating pump, and is swept into the washing-box. Even distribution of the coal is secured by an adjustable vane in the trough. The washing-box is of the Baum type, and the whole of the raw coal is washed in one operation. The average results obtaining in the washery to date are approximately as follows:

| | |
|---|---|
| Raw coal to washing-box . | 7·84 p.ct. to 14·54 p.ct. ash |
| Clean coal . . . . . | 3·36 ,, ,, 6·36 ,, ,, |
| Refuse . . . . . | 58·28 ,, ,, 65·89 ,, ,, |
| Clean dried coal from drier | 2 p.ct. to 3 p.ct. free moisture |

The coals fed to the washery vary greatly in their physical characteristics; the variation being frequent and almost instantaneous, making the operation of washing difficult.

The starting and stopping of such a plant as this coal-handling plant, extending from tippler to coal hopper, a distance of 240 ft. horizontally and 90 ft. vertically, by individual switches would entail much time and labour; moreover, the failure of any portion of the chain of plant to function would cause grave spillage and subsequent labour.

Consequently the plant is electrically-driven throughout; and where one piece of plant is dependent on another, "sequence" starting has been adopted—that is to say, the plant most remote from the source of supply is first started, and then the most remote but one, and so on back to the point of supply. Inversely, when stopping, the machine at the point of supply stops first, and the others in sequence until the last—*i.e.*, the one which was first started. Further, it is provided that, should any element of the sequence stop, all elements nearer the point of supply stop automatically, so that there can be no flooding. When a sequence is stopped under normal conditions, each element runs a sufficient time to clear itself of the load.

Pumps and other electrically-driven plant not in sequence—the Sulzer plant, coke-handling plants (which have separate systems of sequences), the telphers, transporter, and the coal cranes—have separate circuits, and nearly all are controlled by the main switches on a board in the switch house.

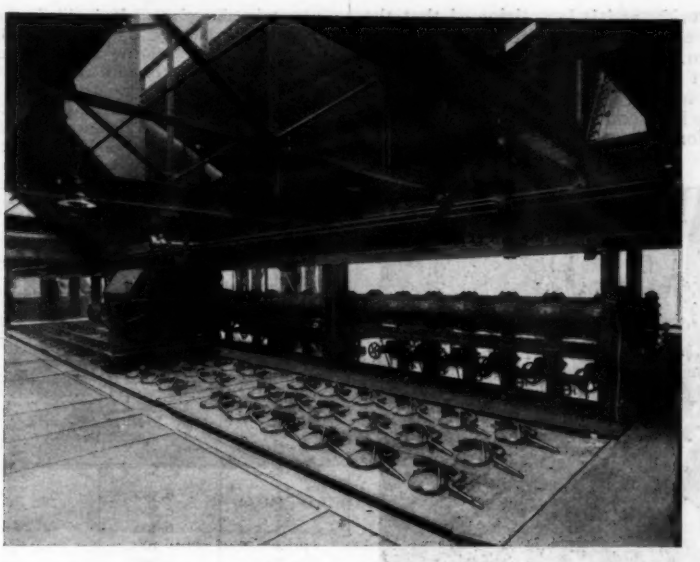
The object is to concentrate control under skilled attention and to ensure electrical safety.

### WEIGHING AND MEASURING.

The total weight of coal supplied to the plant is ascertained by the usual railway weighbridge. The full trucks are weighed on the way to the tipplers, and the empty trucks are tared on the way out, thus giving the net weight of coal supplied. Owing to the washery, these weights do not represent the coal carbonized, which is ascertained by two Blake-Denison automatic weighers situated at a convenient point on the gravity-bucket conveyors.

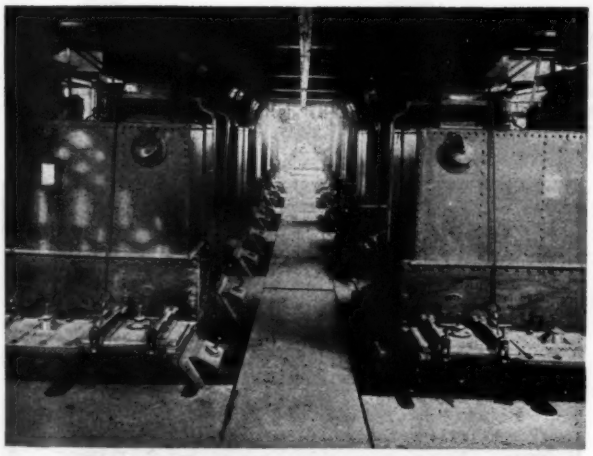
These machines weigh and record the net weight of coal delivered to each of the charging hoppers. Roughly, the weight of coal delivered to the tipplers, less the weight carbonized, gives the weight of the shale removed by the washery. Certain corrections have to be made, due to the varying percentage of moisture in the coal, washed coal, and shale.

The Blake-Denison weighers weigh the coal as the gravity-



W-D CHAMBER OVENS—CHARGING FLOOR.

bucket conveyors move over the machines. The principle of these continuous weighers is simple, but great care and many refinements are included in the machines themselves to ensure accuracy. They are operated by the moving gravity-bucket conveyors. Two lengths of conveyor track, carrying the full and empty strands of the conveyors respectively, are suspended



W-D Continuous Retorts—Auxiliary Hoppers.

from the weighing mechanism, which is so arranged that the weight of the empty conveyor is mechanically deducted from that of the loaded conveyor. The difference recorded is the weight of the contents. The weighing is accomplished in lengths of four buckets; and as each bucket is weighed full and empty during each complete cycle of the conveyor, the difference represents the net weight of the contents.

No provision is made for weighing the coke produced except as it is sold, but an Avery totalizer is provided for each set of producers, whereby the coke used therein is accurately determined.

Coke skips running on monorails are used to charge the producers. A section of the track rail is hung from the levers of the weighing machine. The operator fills the skip and moves it on to the weighing rail, where it is allowed to rest until the pointer of a signal dial has ceased to revolve, after which the skip is pushed forward to the producers.

A printed card showing the aggregate weight can be obtained at any time from any one of the Avery or Blake-Denison machines.

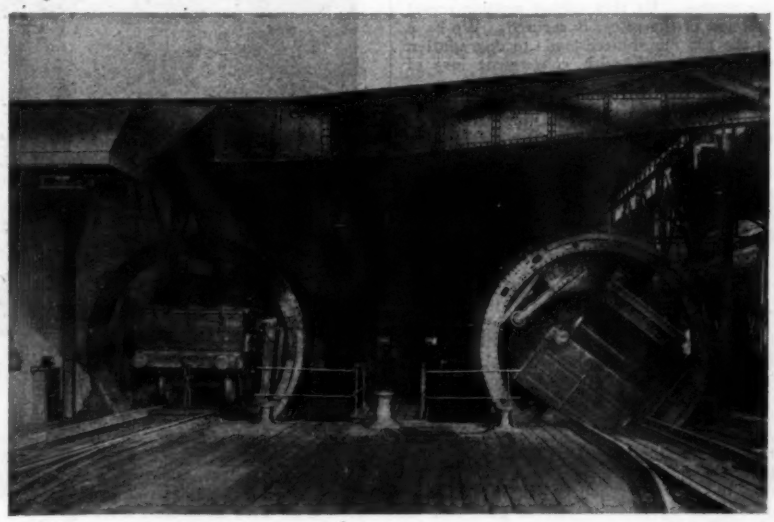
### Waste Heat.

Each continuous bench is fired from five outside producers all delivering into a common CO main, the pressure in which is recorded by an "Arkon" pressure recorder. Similar recorders register the inlet and outlet pull of the fans of the waste-heat boilers. These in conjunction keep the carbonizers informed of local conditions.

The waste-heat gases from each bench are collected in mains and drawn through the tubes of the waste-heat boilers by fans, two of which are driven by steam turbines, and the third by electricity. One boiler is spare. Exhaust steam from the turbines is returned to Royle feed-water heaters, through which all the feed-water is drawn by the pumps.

The waste heat from the two continuous benches is sufficient to raise 28,000 lbs. of steam per hour at 160 lbs. per sq. in. pressure, and, after the portion of it required for steaming the retorts has been abstracted, the balance is superheated 100° Fahr., and used in the works.

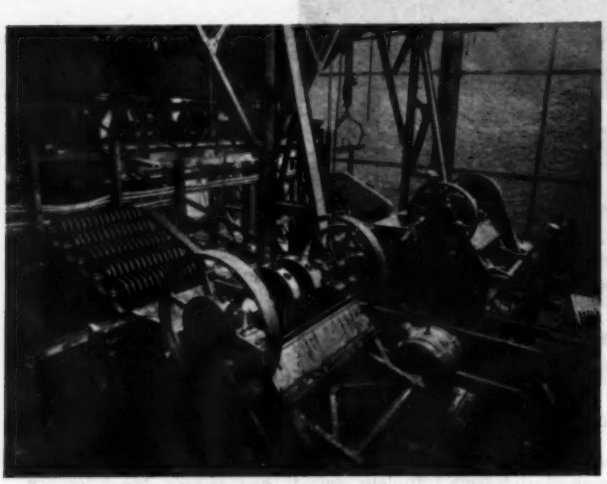
The continuous benches provide sufficient steam for the sum-



BABCOCK ROTARY TRUCK TIPPLERS.

mer requirements of the works, and it is anticipated that the chamber ovens will produce sufficient for the winter load if boilers are provided for them.

"Arkon" recorders chart the $CO_2$ and $O_2$ in the flue gases locally, and "Electroflo" meters indicate and record in the office the temperature of the inlet and outlet waste gases to and from the boilers, for the information of the operator in charge.



3-Inch Grizzley and Norton Breakers.

The steam passing to each bench and to the works is also recorded.

Dent water meters on the supply pipe to the boiler service tanks record the water evaporated.

### VACUUM CONTROL.

The pull on the foul main from exhausters other than those of the turbine type is very variable, causing pulsating in the main and retorts, whereas a steady pressure or pull is essential to secure the greatest output and uniform quality of gas. The ideal arrangement would be a separate governor or regulator for each retort. Expense and complications preclude this. The alternative adopted at Dawsholm is to connect the foul main to the centre of the hydraulic main of each bench by an offtake pipe of ample size, and to provide a governor or regulator on each offtake.

At Provan the usual type of retort-house governor was used, and a battery of four was placed at the end of the retort house, so limiting the maximum pull on the house. As in all such arrangements, no matter how carefully the foul mains are proportioned, the pull falls the farther the point of suction is from the governors. By the use of a separate regulator, placed on the offtake as near the bench as possible, a very regular pull can be maintained. In the present installation, butterfly-type regulators are provided in duplicate at each offtake, one of which can be closed-off for examination and cleaning at any time.

The author is indebted to Dr. E. W. Smith for the following interesting communication on the advantages of close governing:

The necessity for careful governing may with advantage be briefly considered. With continuous vertical working it is a *sine qua non* that the best all-round results are obtained when level gauge is maintained at the top of the retorts. By this means regular travel of the charge in the upper portion of the retort is secured. We have found that air infiltration in the top mouthpiece leads to degradation of hydrocarbons and formation of scurf, with consequent loss of gaseous therms.

A subsidiary advantage in working closely-regulated level gauge on continuous vertical retorts is that the ill effects on the refractories of heating gases passing through cracks into the retort (if for any reason these develop) will be avoided.

In practical working we find that with Scotch coals the rate of gas-making from each retort of a continuous bench is very constant, and therefore their influence one on another is very small. Variations in the rate of gas evolution may arise with other coals, particularly with some of the English slacks. Obviously the finer the governing the less influence any retort which is temporarily hanging up has on those retorts working normally.

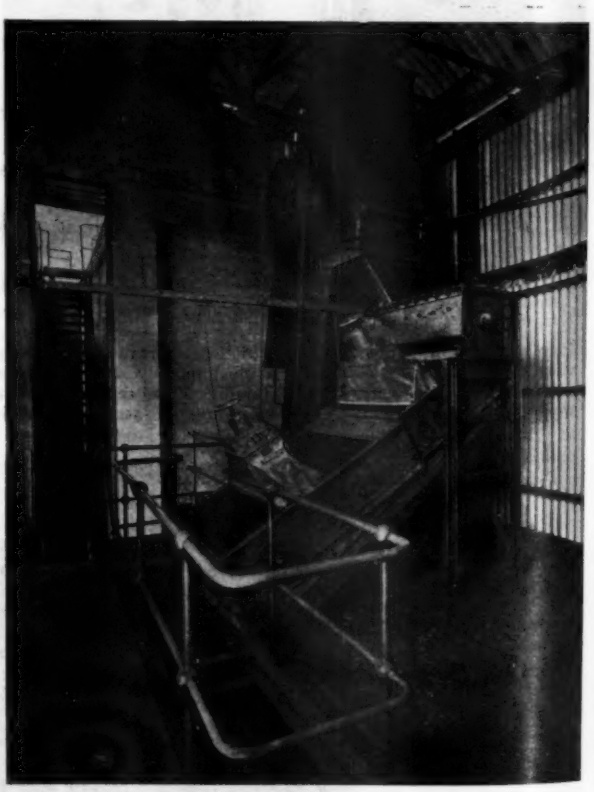
With chamber verticals, and, in fact, with any intermittent system—horizontal, coke ovens, &c.—conditions are very different, though the advantages which follow closely those given above are no less certain. In the first place, there is an hour-to-hour variation in gas evolution from an individual chamber, according to heat progression through the charge; and, secondly, there are the critical periods when chambers are sealed off from the foul main for discharging, when a freshly-charged chamber is opened out again to the foul main, and also when steam is turned on for the water-gas period.

Hollings ("JOURNAL" for June 20, 1928, p. 927) has shown that variations in pressure within the chamber, due to varying rates of gas evolution, may account for an appreciable loss in gas, and he points to the desirability of varying the vacuum or pressure on each individual chamber. This is a development which is being tried out in certain directions. It is likely to lead to some complexity in governing apparatus, and would probably be justifiable only with big units. In the scheme at Dawsholm we have contented ourselves with coping efficiently with the variations in the total output of gas resulting from the variations in individual chambers. The extent of the variations in total gas output of the plant is determined by the particular schedule of charging. This may, perhaps, be best illustrated by comparing the influence of charging regularly through the twenty-four hours with irregular charging, such as is necessitated by two-shift working. The exact figures of the hour-to-hour variations with Scotch coals, as far as is known, have not been determined, but the figures relating to Derbyshire coal published by Dr. Davidson ("JOURNAL" for March 26, 1912, p. 886) may be used for the purpose of this calculation.

*Table Illustrating the Variation in Hourly Gas Make under Various Conditions of Working.*

| Number of Hours after Charging. | Make per Hour from 4·79 Tons of Derbyshire Coal. 12-Hour Charge. | Make per Hour on Three-Shift Working, 4·79 Tons being Charged *each* Hour. 12-Hour Working. | Make per Hour on Two-Shift Working, with Two Four-Hour Periods Rest. | *Plus* or *Minus* over Average Make. |
|---|---|---|---|---|
| | | | | P.Ct. |
| 1 | 6,550 | | 56,700 | − 10 |
| 2 | 6,800 | | 58,350 | − 7·4 |
| 3 | 6,300 | | 59,625 | − 5·3 |
| 4 | 6,100 | | 61,425 | − 2·5 |
| 5 | 6,000 | Practically constant at 63,000 c.ft. per hour. | 64,950 | + 3·1 |
| 6 | 5,700 | | 70,350 | +11·5 |
| 7 | 5,450 | | 71,175 | +13·0 |
| 8 | 4,900 | | 71,700 | +13·9 |
| 9 | 3,650 | | 67,350 | + 6·9 |
| 10 | 2,100 | | 60,300 | − 4·2 |
| Steam on | | | | |
| 11 | 4,900 | | 58,200 | − 7·6 |
| 12 | 4,550 | | 55,875 | − 11·3 |
| Total . . | 63,000 | 756,000 | 756,000 | .. |

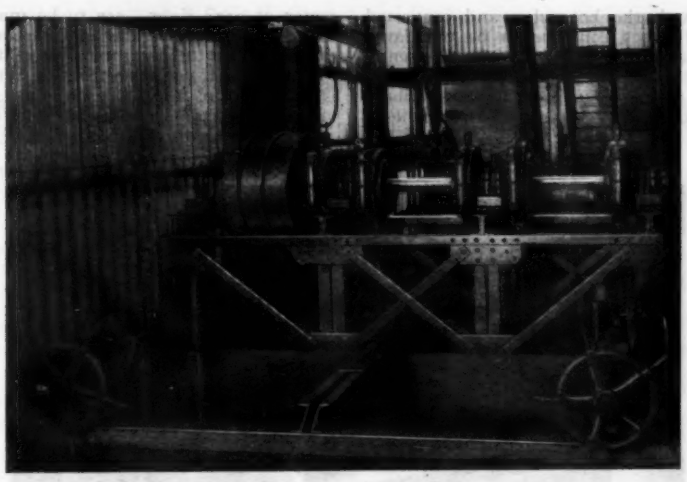
In Col. 2 of the table are given the hourly makes when 4·79 tons of Derbyshire coal were charged at the same time in a bed of Dessau retorts. This quantity of coal is slightly greater than two charges at Dawsholm. With three-shift working we charge two chambers at the hour, and every hour, and, therefore, our hourly make is practically constant. If, however, we were to change to two-shift working, we should require to charge twenty-four times in



Hummer Screen in Washery.

eight hours—say, three chambers at each hour. The hourly variation in total gas from the plant would, therefore, follow the figures given in Col. 4. There would, in fact, be maximum variations from the mean gas make of 13·9 p.ct. above and 11·3 p.ct. below. With two-shift working the governor is called on to do much more work than with three-shift working.

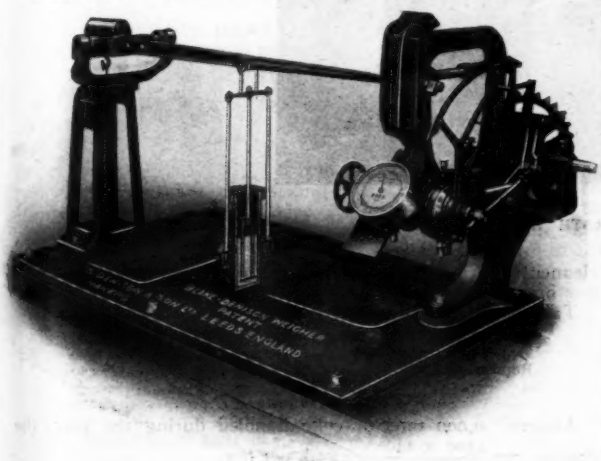
The most serious work for the governor, however, is that of taking care of the variations at charging time and at the period when



BAUM WASHING BOX.

steam is turned on. At charging time the make from two freshly-charged chambers is suddenly put into the foul main. This will increase the gas make by about 6500 c.ft. per hour, or 10·3 p.ct. When the two chambers are shut off prior to discharging, the gas make drops suddenly by about 4500 c.ft. per hour, or 7·1 p.ct. It is obvious that, if the schedule of charging is non-regular, these peak increases are so much greater p.ct. on the average make.

The desire, therefore, for quick response to variations led us to the adoption of forms of governors in which the variations in pressure operate a light relay, the burden of moving the heavy valve and linkwork being taken by the auxiliary source of power—air, oil,



Blake-Denison Weigher, Recording Gear.

or water. The experience with these governors shows that the variations can be kept down to between $\frac{1}{20}$ and $\frac{1}{40}$ in. water gauge, according to the particular governor.

Three types of these regulators have been used—(1) the "Arca," (2) the "Askania," (3) the Peebles. The instruments were supplied by the Cambridge Instrument Company.

An approximate record of the volume of gas made is very desirable on a plant making probably four qualities; unfortunately the volume has to be ascertained while it is hot, and reduced to N.T.P. "Arkon" recorders have been provided for this purpose. One instrument records the volume passing through the offtake from one of the chamber benches, and a second the total volume from the chamber bench and one "continuous bench." The make of the continuous bench is ascertained by difference.

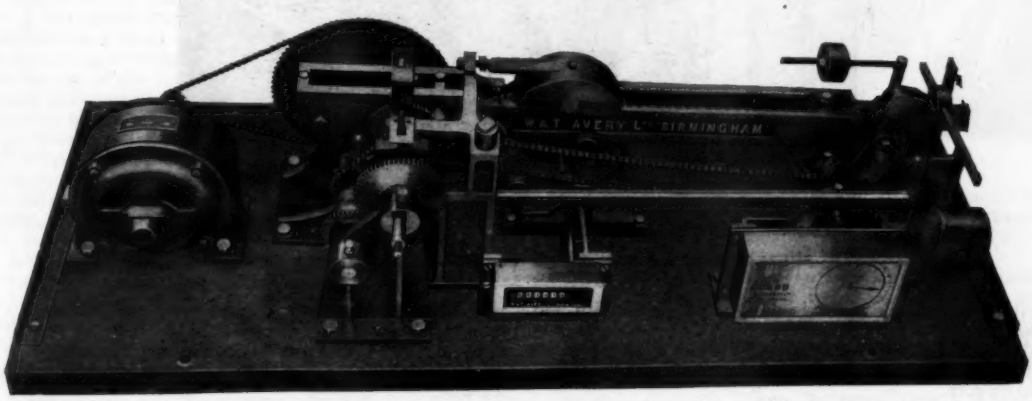
## Coke Handling.

Coke-handling presented difficulties. Provision had to be made for dealing with coke of two qualities and of different values, from 600 tons of coal per day. The area available is restricted, and, as is usual in all reconstruction schemes, the existing lay-out and plant had to be considered. Existing plant consisted of two lines of railway, over one of which was a coke gantry carrying two travelling cranes, and an Arrol "Temperley" transporter crane erected during the war, which was used for stocking coke around its base. Fortunately, the latter is of considerable height, and commands an area 200 ft. in diameter. The gantry and travelling steam cranes have been disregarded in the meantime.

Continuous coke, leaving the retorts in a quenched condition and received in skips resting on bogies running on rails, could readily be handled by the "Temperley" crane; but this would not be available when taking coke from stock, nor would it be at all advisable to depend on one method for handling so much coke, delivered at short intervals, day and night. Handling by the "Temperley" was, therefore, regarded as an emergency measure.

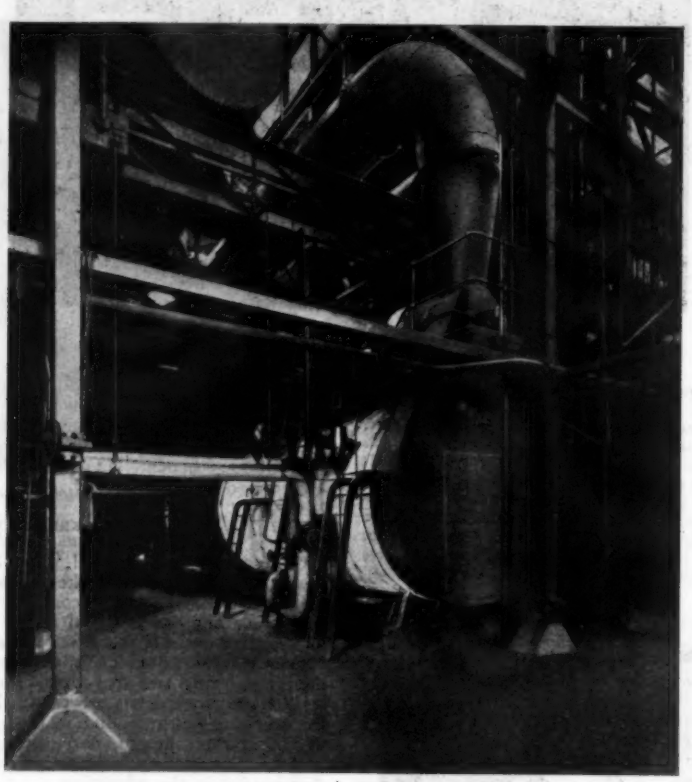
The chamber coke is delivered hot, and has to be quenched or cooled, and stored separately. It was decided to store the coke as received from the retorts, and riddle into the trucks. Two ferro-concrete bunkers, each sufficiently large to contain a week-end make of continuous and chamber coke respectively, have been provided. Each chamber retort is entirely discharged at one operation into the hot coke skips on the rails beneath. The bogie carrying the skip is run from under the bench by the coke haulage rope, and the skip is picked up by the telpher, transferred to the Sulzer plant in the vicinity, and discharged into the Sulzer container. The container which receives the hot coke is a limekiln-like chamber, connected with a tubular boiler by ducts at the top and bottom.

In the first instance the container is filled with dry coke and gradually warmed to drive off moisture. A portion of the cold coke is then drawn off, and replaced at the top with a skip of hot coke. The container is closed, and the gaseous contents



AVERY AUTOMATIC WEIGHING MACHINE—RECORDING MECHANISM.

are circulated upwards through the hot coke, and converted into inert gases. The inert gases continue to be circulated through the coke and boiler alternately, and transfer the sensible heat from the coke to the water in the boiler. There are two units. Various Sulzer plants have been fully described, and the descriptions published in the "JOURNAL" from time to time.



ONE OF THREE W-D WASTE HEAT BOILERS.

### SULZER PLANT AT DAWSHOLM.

The Sulzer plant at Dawsholm is practically a duplicate of that recently erected at Burnley, so ably described by Mr. Clegg in his paper before the Manchester District Institution of Gas Engineers and Managers in December last ("JOURNAL" for Dec. 19, 1928). The Dawsholm plant differs from the Burnley plant in that it is supplied with hot coke by a telpher, and that the discharge chutes swing, to enable the coke to be received (1) in the railway trucks; (2) by the grading plant; (3) by skips to be handed to stock by the "Temperley."

Each unit of the Sulzer plant is designed to deal with 120 tons of coke per 24 hours in an emergency, but 70 to 80 tons is the normal load. This arrangement will allow a repair to be carried out by diminishing the throughput of the whole chamber plant to 75 p.ct.

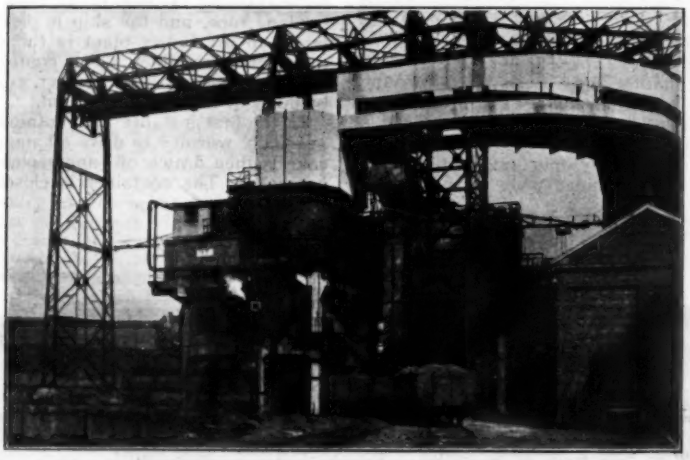
The coke is to be cooled to 550° Fahr., and 840 lbs. of steam at 160 lbs. pressure and 100° Fahr. superheat, from and at feed water at 212° Fahr., are to be made from each ton of coke, calculated as 0·7 of the coal carbonized, provided the coke is delivered at a temperature of 1000° C. (about 1850° Fahr.); but for each 1 p.ct. variation from 14 p.ct. ash a variation of 0·7 p.ct. is to be made, and for each 1 p.ct. of breeze from 10 p.ct. a variation of 1·4 p.ct. in steam is to be allowed.

The advantages of this method of cooling are (1) a better and cleaner coke is produced; (2) moisture is eliminated; and (3) less breeze is produced.

Taking the capital cost at £18,000—

| | |
|---|---|
| Interest and sinking fund and depreciation, 12½ p.ct. | £2250 |
| Wages and supervision | 1500 |
| Repairs, 2½ p.ct. | 450 |
| Cost per annum | £4200 |

Assume 30,000 tons of coke handled during the year, the charges are $\frac{4200 \times 240}{30,000}$ = 33·6d. per ton.



SULZER AND RITCHIE-ATLAS PLANTS FOR CHAMBER COKE.

When the ash content is 10 p.ct. and moisture 2 p.ct. and 1 p.ct. of volatile, there will be 87 p.ct. of free carbon. In ordinary coke the ash is in the neighbourhood of 10 p.ct., moisture about 15 p.ct., and volatile 2 p.ct., leaving 73 p.ct. carbon.

On a basis of 20s. per ton for coke, the "Dryco" is value for 20 × $\frac{87}{73}$ = 23·8, (say) 23s. 10d.—*i.e.*, 46d.-33·6d., or 12·4d.

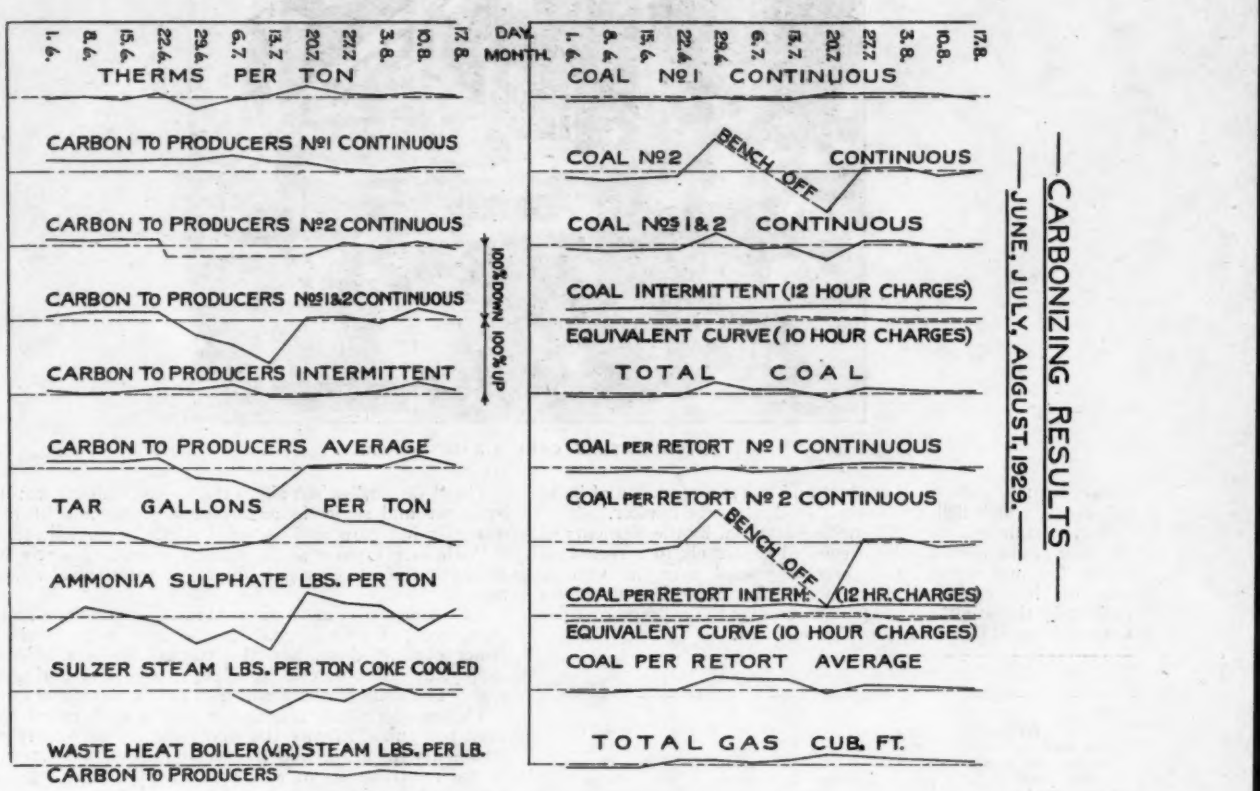

1.6. 8.6. 15.6. 22.6. 29.6. 6.7. 13.7. 20.7. 27.7. 3.8. 10.8. 17.8.
DAY.
MONTH.
THERMS PER TON
CARBON TO PRODUCERS Nº1 CONTINUOUS
CARBON TO PRODUCERS Nº2 CONTINUOUS
CARBON TO PRODUCERS Nº1&2 CONTINUOUS
CARBON TO PRODUCERS INTERMITTENT
CARBON TO PRODUCERS AVERAGE
TAR GALLONS PER TON
AMMONIA SULPHATE LBS. PER TON
SULZER STEAM LBS. PER TON COKE COOLED
WASTE HEAT BOILER (V.R.) STEAM LBS. PER LB. CARBON TO PRODUCERS
100% DOWN
100% UP
COAL Nº1 CONTINUOUS
COAL Nº2 BENCH OFF CONTINUOUS
COAL Nºs 1&2 CONTINUOUS
COAL INTERMITTENT (12 HOUR CHARGES)
EQUIVALENT CURVE (10 HOUR CHARGES)
TOTAL COAL
COAL PER RETORT Nº1 CONTINUOUS
COAL PER RETORT Nº2 CONTINUOUS
BENCH OFF
COAL PER RETORT INTERM. (12 HR. CHARGES)
EQUIVALENT CURVE (10 HOUR CHARGES)
COAL PER RETORT AVERAGE
TOTAL GAS CUB. FT.
CARBONIZING RESULTS
JUNE, JULY, AUGUST, 1929.

DIAGRAM SHOWING RESULTS OF WORKING OF PLANT.

per ton in advance of working costs. The steam produced (30,000 × 800 at 2s.) = £2400. A reduction of 5 p.ct. in the breeze amounts to 30,000 × 5 p.ct. = 1500 tons. If the value of "Dryco" is 24s. and breeze 6s., there is a difference of 18s. per ton on 30,000 tons = £1350.

To summarize, on the assumed basis price of 20s. per ton for coke—

| | £ |
|---|---|
| Improved value of "Dryco" | 5750 |
| Saving in breeze | 1350 |
| Steam produced | 2400 |
| | £9500 |
| Deduct capital and running charges | 4200 |
| Annual balance | £5300 |

There is a small saving for quenching water of (say) £50, and much in amenities.

During July, 1688 tons were cooled and 935 lbs. of steam raised per ton. The temperature of the coke was 1780° Fahr., of the inlet gases to the superheaters 760° Fahr. (average), and to the container 340° Fahr. The coke leaves the container at about 400° Fahr.

### Coke Grading.

The chamber coke for grading is discharged from the cooler into a small hopper, from which it is withdrawn by a short plate conveyor or feeder, supported on springs in such a manner that the weight of the coke depresses the feeder and closes an electrical circuit which starts the plant in sequence. The plate feeder delivers to a band conveyor, which discharges into the rotary filler of a gravity-bucket conveyor. By this the coke is raised to the top of the bunker and distributed by a travelling shuttle-band conveyor in the bunker. Every part of the bunker is commanded by the shuttle band, and consequently it can be completely filled. When the conveying plant has dealt with the discharge from the cooling plant, it runs long enough to clear itself, then stops.

It was necessary that the "Temperley" should swing over this bunker, so that coke might be grabbed from stock and deposited in it. Unfortunately the clearance available was limited, and consequently the arrangement of the plant below the bunker is somewhat crowded. The bottom of the bunker is formed in the shape of two valleys. Apertures are provided at intervals in the valleys, and each aperture is controlled by a sliding valve and a rotary feeder, the latter giving a continuous regular stream of coke to the band conveyor beneath. The conveyor delivers through a chute either direct to the screens or through a coke breaker to the screens. In both cases the coke is graded into four sizes—breeze, nuts, eggs, and over—into small hoppers, which deliver into the railway wagons below. Each of these hoppers is of rather less capacity than a railway truck; consequently there can be no accumulation of smalls among the graded coke, as is usual if it is graded to stock in bunkers of larger capacity. A Norton coke breaker is placed so that the coke from either band conveyor can be delivered to it. It is reversible, and the coke from the east conveyor, when broken, would be riddled by the west trommels. Such an arrangement might prove inconvenient, and the difficulty is obviated by a short reversible belt under the breaker, which returns the broken coke to the section from which it came.

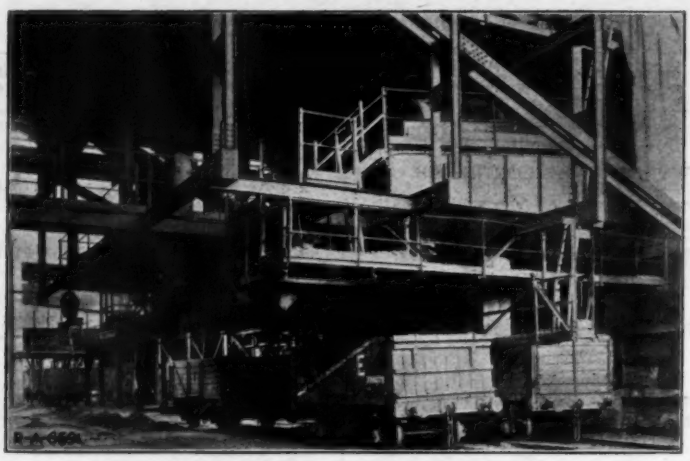
The trommel screens are the patent of the Ritchie-Atlas Engineering Company, and consist of two screens, one within the other, which rotate in opposite directions. The patentees justly claim an improved delivery and cleaner material from the arrangement.

Appliances are provided to load carts with any size of coke.

Feeders below Coke Bunkers.

Should the bunkers prove inadequate to contain the coke made, it can be deposited in the stock yard by the shuttle-band conveyor and a swing chute on the end of the bunker, and returned to the bunker for screening by the "Temperley."

The continuous coke is handled in a somewhat similar manner to the bunker, which is nearly square, and has three valleys in the bottom. The coke skips are run from beneath the benches by the skip haulage plant, or by small steam locomotives, to below one of two telphers which command the four producer coke hoppers, the two breeze hoppers, and a storage receiving hopper. When the requirements of the carbonizing plant have been met, the balance is deposited in the receiving hopper by the telpher. The weight of coke acting on a feed



RITCHIE-ATLAS COKE GRADING PLANT.

conveyor makes electrical contact and starts a sequence of band conveyors, which deliver the coke to the storage bunker.

To ascertain the cost of handling material by the elements of the new plant, each has been coupled separately to a recording meter for one week. The amount passed over the various elements has varied week by week, but the kilowatt hours divided by the week's tonnage is entered as the average cost per ton of material dealt with by that element.

| — | Tons. | KW.-H. per Ton. |
|---|---|---|
| Element— | | |
| Capstan and tippler | 3188 | 0·0314 |
| Sure feed | 3080 | 0·0137 |
| Breaker and grizzley | 3080 | 0·0824 |
| Shuttle band | 2818 | 0·0320 |
| Fines grizzley | 602 | 0·0442 |
| G.B. Conveyor | 2818 | 0·3243 |
| Shuttle band at hopper | 1589 | 0·0097 |
| | | 0·5377 |
| Washery— | | |
| Raw coal band | 231 | 0·0653 |
| Raw coal elevator | 396 | 0·2144 |
| Hummer screen | .. | .. |
| Feed table and washer | 231 | 0·4965 |
| Circulating pump | 278 | 0·9137 |
| Drainer | 232 | 0·1558 |
| Centrifuge | 396 | 0·4582 |
| Clean coal and shale elevator | 278 | 0·2658 |
| | | 2·2900 |
| Blending— | | |
| Sure feeds | 694 | 0·0663 |
| Band | 720 | 0·0146 |
| Disintegrator | 720 | 0·4060 |
| Band to G.B. | 694 | 0·0287 |
| | | 0·5156 |

The cost in current of handling coal from truck to retort works out at 0·5377 unit, which is fairly correct.

The washery at 2·29 units per ton is probably on the high side, as the throughput during the trial weeks happened to be low. The cost of 0·5156 unit per ton for blending is representative.

The total cost per ton of coal handling to the retorts, based on 12 weeks' working, when three benches were working, is 5·03d. per ton; for coal washing and coal blending, 8·27d. per ton. The loss of shale is 0·39 p.ct.

The cost of handling the chamber coke from Sulzer to railway trucks, including grading, is 0·57 unit of current per ton; and of continuous coke 0·34 unit per ton.

The figures are based on 2566 tons of chamber coke and 9900 tons of continuous coke.

The washed fines contain 9 p.ct. of moisture and 8 p.ct. of ash.

The "Dryco," or special coke, contains from *nil* up to 2½ p.ct. of moisture, 9 to 10 p.ct. of ash, and 1½ p.ct. of volatile.

The "Dryco," when about the size of walnuts, can be lighted by paper and sticks in an ordinary grate, and burns with an intensely hot glow and does not spark or decrepitate.

With such a plant as Dawsholm producing a relatively large proportion of the City gas supply, no mechanical risks could be run.

All the essential mechanical plant is in duplicate and of ample capacity; 720 tons of coal can be dealt with in six hours by either coaling plant, and the storage hoppers hold 53 hours' supply, therefore no coal handling is necessary during the week-end. The coke bunkers will also hold a week-end output.

That modern carbonization is largely a chemical process has been recognized; hence the many indicating and recording instruments installed, and the well-equipped laboratory adjacent to the retort house, in which the chemist in charge can collect and analyze data and instruct the carbonizers.

The producers, benches, waste-heat boilers, Sulzer, and other plants are interdependent; and the result of one indicates the condition of the others.

### RESULTS.

The records for the working of two continuous and one chamber bench are available for June, July, and August of this year. These are three months during which the demands for both coke and gas are low, and July is the holiday month.

The base lines on the diagram represent the expected output from the amount of plant in operation. Deflections to the left of the base lines are below, and to the right above the normal, expressed in percentage of expected output. The spaces between the base lines represent 100 p.ct.

### Discussion.

The PRESIDENT suggested that the most striking feature of the new plant was the arrangement made for recording results.

Mr. J. W. MCLUSKY (Glasgow) expressed his appreciation of Mr. Harrison as an Assistant. Six years ago, continued the speaker, they considered certain weaknesses in the Provan plant, which, as he had probably remarked before, was as good a plant as one had seen anywhere. Locally, however, they had trouble from the breeze produced. They therefore set out to get rid of this breeze. They had been criticized for washing smalls. They were told that this ought to be the job of the owner of the colliery. Scottish gas engineers, however, knew quite well that where coal was specified as double screen there was eventually an objectionable amount of fines in it before it reached the retort bunker. They had eliminated this difficulty in the Dawsholm plant. At the present time they were producing excellent coke, and they had the satisfaction of knowing that they were gradually finding out what was the best coking coal in Scotland to mix with what was called non-coking smalls, consistent, of course, with a satisfactory volume of gas and an equally satisfactory low price into holder. He believed that the contractors' expectations would be fulfilled. He would like to say how much they in Glasgow appreciated what the contractors had done for them. All the contractors had entered into the work with enthusiasm. Probably in two years' time he would be able to give the Association an interesting set of results.

Mr. HARRISON acknowledged the vote of thanks.

**Trade Exhibition at Buenos Aires.**—An Empire Trade Exhibition in Buenos Aires is now being organized for six weeks during February, March, and April, 1931. This project, initiated by the British Chamber of Commerce in Buenos Aires, has the warm approval of all leading and commercial bodies in Great Britain. Anglo-Argentine interests, both at home and abroad, have given it their strong support and, in addition, have subscribed substantial guarantees. The Exhibition grounds cover 25 acres, and are close to the centre of Buenos Aires. The object of the Exhibition is to place British trade with Argentina more on a par with British purchases and investments there; to demonstrate not only to Argentina, but also to all South America, that British initiative, British goods, and British salesmanship, backed by British credit, so far from declining, are preparing to reach higher levels than before. No firm wishing to increase its business overseas can afford to overlook the markets of South America, and especially that of Argentina, and all who are able should take advantage of this valuable Exhibition in Buenos Aires. All communications regarding the Exhibition should be addressed to the General Manager, British Empire Trade Exhibition, Buenos Aires, 1931, 5, Parliament Mansions, Orchard Street, S.W. 1.

# LIGHTING APPLIANCES FOR THE COMING SEASON.

## Lanterns with Burners in Alignment.

This season Messrs. Foster & Pullen, Ltd., of Bradford, are making a special feature of lanterns with burners in alignment, and also separate conversion sets in alignment for existing lanterns. This method of burner arrangement was thoroughly tested by the firm last season, and proved very successful.

One of our illustrations is of a 4-light lantern of the firm's make. The heavy brass burner merits special attention. It is of the superheater type, with gas and air adjusters, and copper supply tube and connections. The four nozzles are fixed in alignment, and not in a circle as is usual. By this arrangement a greater proportion of the light is directed along the street where it is required, and is not wasted on the adjacent buildings. There is the further advantage that the shadows caused by the body ribs, &c., of the lantern are minimized. The controller and by-pass may be used or not as preferred, and may be of any recognized type. This also applies to the cock. Between the cock and gas supply is fixed one of the firm's patent adjustable connections, which compensates for any variation in height of service pipe and dispenses with the use of lengthening pieces, nipples, or other fittings. This is a great time-saver, as a sound gas-tight joint can always be made in a few minutes.

Our other illustration is of a 3-light heavy brass superheater burner with the nozzles in alignment.

# CORRESPONDENCE.

*[We are not responsible for opinions expressed by Correspondents.]*

## Institution Education Scheme.

SIR,—I understand that the new regulations relating to the Education Scheme are not yet available in quantities sufficient for distribution. Might I suggest that the publication of these regulations in the Press would materially assist isolated students who are concerned about the changes that have been made?

BM/FPMN.

*Sept.* 18, 1929.

## Gas Lighting.

SIR,—The articles and letters which have recently appeared in the Technical Press on the subject of the lighting side of the industry were considered at meetings yesterday of the Executive and General Committees of the "B.C.G.A."

So far as those are concerned who suggest that either the National Gas Council or the British Commercial Gas Association are indifferent to the lighting load and have "thrown up the sponge" in the fight with our competitors, I was desired to say that the anonymous correspondent who has expressed that belief must be very much out of touch with the work of this Association, and that if he, or any gas manager or maker of lighting appliances will communicate direct with me, we shall be very pleased to give him "illuminating" information on the subject, which, however, we do not propose to publish for the benefit of our competitors.

The following extract from the Annual Report, which was adopted yesterday for circulation to members, will, in the meantime, assure the industry that the matter is, and has been, receiving full attention:

> The subject of lighting has received special attention alike in regard to editorial and other publicity matter dealing with all sides of the subject supplied to the Press or issued to the industry, and to advertisements designed for the use of subscribing undertakings. As the result of special conferences on the subject, arrangements have been made for the inclusion of lighting among the subjects dealt with in district newspaper advertising whenever the District Committees so desire.

The question of establishing a "Gas Lighting Service Bureau" was referred for early consideration to the standing Joint Committee of representatives of this Association and of the Lighting Section of the Society of British Gas Industries. A meeting of that Committee is being summoned for an early date.

At the same time, I am desired to emphasize the point that no advertising—local, district, or national—and no literature, however attractive and effective, is any substitute for good maintenance service to the customer in the home or factory, or for that periodical inspection of every customer's equipment, for lighting or for other purposes, which this Association has constantly advocated and many progressive undertakings have adopted.

J. C. WALKER,
Secretary.

*British Commercial Gas Association,*
*28, Grosvenor Gardens, S.W. 1,*
*Sept.* 19, 1929.

**The Year's Results at Swadlincote.**—The annual accounts of the gas undertaking of the Swadlincote Urban Council for the year ended March, 1929, show that the total income on revenue account was £20,407, and expenditure £14,656, leaving a gross profit of £5745. Loans and interest payments absorbed £4104 and income-tax £503, leaving a net profit of £1138. Out of this amount, £1018 was expended on extensions. The overdraft at the bank, however, had been increased during the year from £3378 to £3977, due largely to expenditure on gas cookers. The amount outstanding on hire-purchase account was now £2673.

**South Australian Gas Company.**—The report and statements of account of the South Australian Gas Company for the year ended June 30, 1929, show that the profit (before providing for special purposes fund) after paying interest on bonds amounted to £97,983. This has been applied in the following manner: The declaration of a dividend for half-year ended Dec. 31, 1928, at the rate of 8 p.ct. per annum, and for the half-year ended June 30, 1929, at the rate of 7 p.ct. per annum, and the transference to special purposes fund of £3292 17s. 3d., which leaves a balance to be carried forward in profit and loss account of £940 2s. 11d.

# MISCELLANEOUS NEWS.

## GLASGOW'S GAS SUPPLY.

### Twenty Millions Daily from Outside Source.

At their last meeting, the Corporation of Glasgow considered a unanimous recommendation by the Gas Committee to accept an offer by Messrs. John Gardner (Collieries), Ltd., to supply to the Corporation 20 million c.ft. of purified gas per 24 hours, at a cost of 8·4d. per 1000 c.ft.

On this subject a report had been issued by Mr. J. W. McLusky, General Manager of the Gas Department, to the members of the Corportion. The report stated that the quantity of gas mentioned would cost the Department £255,500, and that, taking to-day's costs, allowing for all modern plant working efficiently, and for charges on new mains and stand-by plant, the net surplus per annum was estimated at £126,000, or nearly 4d. per 1000 c.ft. of gas sold.

The total consumption of gas in Glasgow at the present time ranged from 20 million c.ft. per day in midsummer (June and July only) to approximately 40 millions per day in mid-winter. Figures which were given showed that a total of 31 million c.ft. could be manufactured and stored at a works cost of 1s. per 1000 c.ft.

Large Financial Advantage.

Bearing in mind, Mr. McLusky stated, that this gas was to be produced from coal at the pithead costing the contractor about 5s. less per ton than the price charged to the Gas Department, the difference between the contractor's offer of 8·4d. per 1000 c.ft. and the Department's cost of 1s. in the gasholder was immediately justified. A reduction of 5s. per ton on the Department's coal bill would yield £145,000, or fully 4d. per 1000 c.ft. financial advantage.

One of the outstanding advantages to be gained by accepting the offer of Messrs. Gardner, stated the Manager, was that it would enable the Department to offer large quantities of gas to public works and factories, where an abundant supply of cheap gaseous fuel would be decidedly attractive. It was anticipated, he said, that after one year's experience of the proposed scheme the price of gas to the ordinary consumer could be reduced to 2s. 9d. per 1000 c.ft., being an advantage to the consumers of £225,000 per annum.

At the end of the period of agreement—namely, fifteen years—should the members of the Gas Committee consider it to be expedient, they might exercise an option to recommend that the Corporation negotiate for the purchase of the plant, and thereby control it as a municipal enterprise.

No Plant Being Scrapped.

Mr. James Walker (Convener of the Gas Committee) said that the Department were not scrapping any plant at all. Plant would remain in existence capable of producing 31 million c.ft. per day, and would be kept in order so that at any moment it could be put into operation.

On a vote being taken, the scheme was approved by 36 votes to 21 votes.

## HORLEY GAS COMPANY.

### Sound Position Reviewed—Half-Yearly Meeting.

Owing to the Chairman, Mr. H. Mitchell, being indisposed, Mr. H. J. Randall presided at the ordinary half-yearly general meeting of the proprietors of the Horley District Gas Company, held in the Gas Offices, Horley, on Wednesday, Sept. 18.

The Directors' report and statement of accounts for the half-year ended June 30 was then presented. This stated that the profit and loss account showed an available balance of £5122, after providing for the fixed charges for interest. The Directors recommended payment of dividends at the rate of 5 p.ct. per annum on the preference stock, 11 p.ct. per annum on the "A" capital stock, and £7 14s. p.ct. per annum on the additional "B" capital stock (all *less* income-tax), which would absorb the sum of £2355, leaving a balance to be carried forward of £2767.

Before moving the adoption of the report and statement of accounts, the Chairman said that it was his sad duty to refer to the death of their late Chairman, Mr. J. W. Stevens. As most of them knew, Mr. Stevens was connected with the Company for many years, having joined the Board as far back as 1896, and had occupied the position of Chairman since 1917. At the request of the Chairman, the meeting stood for a few moments in silence, in memory of their late colleague.

In moving the adoption of the report and statement of accounts, the Chairman said:

It is interesting to note that the sale of gas has increased by over 6¾ millions compared with the corresponding period of last year, equal to 15·8 p.ct., which is very satisfactory. During the half-year, we have obtained 95 new consumers, and have fixed 204 new appliances. Our district is rapidly developing, and the Directors look forward, with confidence, to further increases in our expenditure during the half-year. Coals and oils have cost more owing to our increased output. Repairs and renewals of works show an increase primarily owing to the carbonizing plant having generally to be overhauled. There has also been an increased expenditure on mains account, being the cost of relaying and replacements to cope with extra demand. Our rates are more, due to the re-assessment under the New Rating and Valuation Act.

Our receipts on the whole are very satisfactory, there being a substantial increase over last year's figures. The Directors have recently installed a new coke breaking, screening, and grading plant, which is now in operation, and it is hoped good results will ensue from its adoption. Receipts from residuals show a decrease, but this is in common with most other gas companies. Our rental receipts, however, show a substantial increase, consequent upon our increased sale.

Mr. R. Seymour Tobey seconded the motion, which was carried unanimously.

Mr. Tobey also proposed that the dividends mentioned in the Directors' report be paid for the half-year ended June 30, and Mr. Ely seconded.

A vote of thanks to the Directors for the way in which they had conducted the affairs of the Company was proposed by Lieut.-Col. Braithwaite, who said that he felt sure that, under the Chairmanship of Mr. Mitchell, the Directors would continue to conduct the Company in the efficient manner which had always been associated with them.

Mr. Chisholm seconded, and also paid tribute to the work of the Secretary and the staff.

## GAS ACTS ORDERS (1920 AND 1929).

### SECTION 6.

**Bingley Urban District Council.**

The Council shall, from April 1, 1930, charge according to the number of B.Th.U. supplied, and shall on or before Jan. 1 give notice of the calorific value of the gas they intend to supply

**Bishop Auckland Gas Company.**

The Company shall, from Jan. 1, 1930, charge according to the number of B.Th.U supplied, and shall on or before Oct. 1 give notice of the calorific value of the gas they intend to supply.

**Congleton Corporation.**

The Corporation shall, from April 1, 1930, charge according to the number of B.Th.U. supplied, and shall on or before Jan. 1 give notice of the calorific value of the gas they intend to supply.

**Droitwich Corporation.**

The Corporation shall, from April 1, 1930, charge according to the number of B.Th.U. supplied, and shall on or before Jan. 1 give notice of the calorific value of the gas they intend to supply.

**Evesham Corporation.**

The Corporation shall, as from April 1, 1930, charge for gas according to the number of B.Th.U. supplied, and shall on or before Jan. 1, 1930, give notice of the calorific value of the gas which they intend to supply.

**North Berwick Corporation.**

The Corporation shall, as from April 1, 1930, charge for gas according to the number of B.Th.U. supplied, and shall on or before Jan. 1, 1930, give notice of the calorific value of the gas which they intend to supply.

**Sunderland Gas Company.**

The Company shall, from Jan. 1, 1930, charge according to the number of B.Th.U supplied, and shall on or before Oct. 1 give notice of the calorific value of the gas they intend to supply.

### SPECIAL ORDER.

**Barry Urban District Council.**

To increase the authorized maximum price of gas, and to make other financial provisions.

### DECLARATIONS OF CALORIFIC VALUE.

**Carlisle Corporation.**—450 B.Th.U. (April 1, 1930).

**Grays and Tilbury Gas Company.**—Altered to 500 B.Th.U. (Dec. 25).

**Leominster Gas and Coke Company, Ltd.**—500 B.Th.U. (Jan. 1, 1930).

**St. Ives (Hunts.) Gas Company, Ltd.**—500 B.Th.U. (Jan. 1, 1930).

**Swindon United Gas Company.**—450 B.Th.U. (Jan. 1, 1930).

**Tunbridge Wells Gas Company.**—475 B.Th.U., in substitution for 450 B.Th.U. (Dec. 30).

**Alliance and Dublin Consumers' Gas Company.**—The accounts submitted show a profit on the revenue account of £77,647, and, after providing for interest on debenture stock, interest on temporary loans, and income-tax, there remains the sum of £55,161, to which must be added the sum of £28,060, being the balance brought from last account, making a total of £83,222. The Directors recommend the declaration of a dividend on the consolidated ordinary stock of the Company at the rate of £7 12s. 6d. p.ct. per annum (this being the maximum statutory dividend permissible under the sliding scale provisions, when gas is sold at the rate obtaining during the half-year concerned), *less* income-tax, which will absorb the sum of £59,164, after which a balance of £24,057 will remain to be carried to the next account.

## GROWING GAS CONSUMPTION AT GUILDFORD.

### Satisfactory Progress.

Mr. FERDINAND SMALLPEICE (Chairman of Directors) presided at the half-yearly meeting of the Guildford Gas Light and Coke Company.

The Directors, in their report, stated that the sale of gas during the half-year showed an increase of 15,646,400 c.ft., or 8·8 p.ct., as compared with the corresponding period of last year. The balance standing to the credit of the profit and loss account, including that brought from the previous account, was £18,097. Out of this sum the Directors recommended the payment of dividend, as stated below, leaving to be carried forward £12,523. The reserve fund to the credit of the Company now stood at £11,172. In pursuance of the authority given by the shareholders at the last half-yearly meeting, the Directors had raised £21,500 additional debenture stock, the amount received being £19,769.

The CHAIRMAN, moving the adoption of the report and accounts, mentioned that seven miles of new mains had been put down to cope with increasing business. There were 299 additional consumers, and 324 new cookers and gas fires were sold during the half-year. To meet the anticipated demand for the winter, large extensions were being carried out, including retort house, purifiers, and a station meter for registering the whole of the gas made on the works.

Mr. W. STEVENS seconded, and the proposition was carried.

The maximum dividend of 5 p.ct. upon the preference stock, and a dividend of 7½ p.ct. upon the consolidated ordinary stock, both *less* income-tax, for the half-year ended June 30, was declared on the proposition of Mr. W. T. PATRICK, seconded by Mr. STANLEY ELLIS.

A vote of thanks was accorded the Chairman and Directors, Engineer and Secretary, and the staff of the Company on the proposition of Mr. A. W. OKE, seconded by Mr. R. W. EDWARDS.

Afterwards shareholders inspected the additions being made at the works, which were explained by Mr. Nicholas, the Engineer, Manager, and Secretary.

## METROPOLITAN GAS COMPANY OF MELBOURNE.

### Extracts from the Chairman's Address.

The Half-Yearly Meeting of the Company was held in Melbourne on July 27—Sir JOHN GRICE (Chairman) presiding.

The CHAIRMAN, submitting the report and balance-sheet of the Company for the half-year ended June 30 last, said that the sales of gas amounted to 2041 million c.ft., with a revenue of £721,533, compared with 2036 millions and £717,638 for the six months ended June 30, 1928. The price of gas was 7s. 1d. per 1000 c.ft. during the half-year under review. Receipts from residuals totalled £126,928—a reduction of £8862 in comparison with the June half of 1928. The sales of coke and breeze amounted to 83,640 tons, a decline of 6365 tons against the 1928 period. Tar sales totalled 2,087,042 gallons, compared with 2,246,877 gallons in the corresponding half of 1928. The reduction was caused principally by the increased use of improved bitumen in preference to Australian tar for road construction. Progress had, however, been made with the production of an improved preparation of tar; and the Company's technical staff hoped to be in a position, in the near future, to manufacture a product which would, it was believed, enable the Company to supply a larger quantity of material for road construction. The whole of the sulphate of ammonia sold—699 tons—was disposed of for use in Victoria and Tasmania.

The profits for the half-year were £89,356; and, after making a transfer of £5000 to the meter renewal fund account, the Directors decided to recommend that a dividend at the rate of 6s. 6d. per share be declared for the half-year. Again it had been impossible to make any transfer to reserve fund; and this state of affairs could not be allowed to continue. Though the Directors had so far refrained from increasing the price of gas, it would be necessary to act in this direction at an early date.

The number of meters standing fixed at June 30 was 188,378, compared with 187,273 at Dec. 31, 1928—an increase for the half-year of 1105. Though unsettled industrial conditions and the cessation of building operations naturally affected the business of the stove and fittings department during the half-year, gratifying progress was made. Industrial appliances continued in demand—287 being sold in comparison with 221 for the corresponding period of 1928. Evening demonstrations in the application of gas to industry were given to the Chamber of Manufactures and other bodies during the half-year, and keen interest continued to be displayed by manufacturers in this branch of the business. Two instructresses visited 2100 gas stove users during the half-year, giving tuition.

No. 3 Section of the Woodall-Duckham retorts at the West Melbourne Works had been reconstructed with special silica material by Woodall-Duckham (Australasia) Pty., Ltd. This plant had recently been put to work, and the carbonizing results to date were satisfactory. Completion of the carburetted water gas plant had to be considerably expedited owing to the stoppage of coal supplies. Without the addition of this plant, which was now fully in operation, it would have been necessary to curtail the supply of gas to the public.

**"Evening World" Ideal Home Exhibition.**—At the North-East Coast Exhibition the "Evening World" are staging an Ideal Home Exhibition; and the Newcastle-upon-Tyne and Gateshead Gas Company are demonstrating that no home can be ideal without gas. Needless to say, the demonstration is highly attractive.

## COAL TRADE REPORTS.

### From Our Own Correspondents.

### NORTH-EAST COAST.

While Northumberland coals are reported to be enjoying brisk trade, the Durham position, as regards gas, coking, and bunker business, remains irregular. In the last few weeks there has been a decided falling off in the prompt demand, and the weakness has been accentuated by the shortage of boats. There has been a considerable weakening in values; but sales made for the remainder of the year form a good basis, and, with the normal seasonal demand, a revival seems more likely than any further fall.

Wear Special gas makes remain firmly quoted at 17s. 6d. f.o.b. and, apart from occasional tonnage difficulties, best qualities are well held at 16s. 6d. to 17s. Seconds are easy at 15s. to 15s. 6d. Unscreened coking coals are irregular; 15s. 6d. to 16s. being asked, with occasional cheaper lots available. Bunkers are very quiet, best makes being no better than about 16s., with seconds easy round 15s. Best Northumberland screened steams are firm at 16s. to 16s. 3d.

Gas coke remains very steady at 21s. 6d. to 22s. f.o.b. for shipment.

### YORKSHIRE AND LANCASHIRE.

The demand for gas coal is increasing, but supplies are easily obtainable. Export requirements continue to be fairly large, and there is no difficulty in maintaining quotations of 18s. per ton f.o.b. The inquiry for secondary kinds is stronger, and values are firmer. Requests for furnace coke continue good, with values of from 23s. to 24s. per ton f.o.b.

The domestic trade is quiet except for best qualities, which are in good demand, and there is some delay in delivery. For industrial fuel there is a better request on home account, while smalls are firmer.

The following are the Humber bunker and export prices, f.o.b. usual shippings ports:

South Yorkshire—Hards, Association, bunkers 19s. 3d., export 18s. to 18s. 6d.; screened gas coal, export 18s. to 18s. 6d.; washed trebles, export 18s. to 18s. 6d.; washed doubles, bunkers 18s. 9d., export 17s. 6d. to 18s.; washed singles, export 16s. 6d.; washed smalls, bunkers 16s. 3d., export 15s. 6d.; rough slack, bunkers 13s. 6d. to 13s. 9d., export 12s. 6d. to 13s.; smithy peas, export 18s. 6d. to 19s. 6d.

West Yorkshire—Hartley's (f.o.b. Goole), bunkers 17s. 6d., export 17s. to 18s.; screened gas coal, export 18s. to 18s. 6d.; washed trebles, export 18s.; washed doubles, export 16s. 3d. to 16s. 9d.; washed singles, export 16s.; washed smalls, bunkers 15s. 3d., export 14s. 6d.; unwashed trebles, export 17s. 6d.; unwashed doubles, export 15s. to 16s.; rough slack, bunkers 13s. 6d., export 12s.; coking smalls, export 12s.

Derbyshire and Nottinghamshire—Top hards, bunkers 19s. 3d., export 18s. to 18s. 6d.; cobbles, bunkers 18s. 9d., export 17s. 6d.; washed trebles, export 18s.; washed doubles, export 17s. to 17s. 3d.; washed singles, export 16s. to 16s. 6d.; washed smalls, bunkers 16s., export 14s. 6d.; unwashed doubles, export 16s.; rough slack, bunkers 14s. 3d. to 14s. 9d., export 12s. 6d.

Yorkshire, Derbyshire, and Nottinghamshire—Screened steam coal, bunkers 17s. to 18s., export 16s. 6d. to 17s.; gas coke, export, 23s. to 24s.; furnace coke, export 23s. to 24s.; washed steam, Goole (West Yorkshire), bunkers 17s. 9d.; Hull (West Yorkshire), bunkers 18s.; Hull (South Yorkshire), bunkers 18s. 3d., export 17s.

### MIDLANDS.

With conditions more favourable to development in the house coal trade, stocks which have accumulated are being reduced. Operations at many of the inland pits are still severely curtailed. There has been little chance of disposing of the standard quota at some of them.

A superabundance of smalls and slack is attributed to reduced exports. There is said to be a considerable turning diversion of supplies from export to land sale, with consequent congestion in the home market. The points at which the glut is most apparent are too far removed from the coke ovens to make it possible to bridge the transport difficulty. Even with blast-furnace coke at 17s. 6d. to 18s. at the ovens, and more in cases where it is applied to what used to be considered alien uses, it is not a paying proposition to carry the surplus over long distances to the ovens. Some spot lots have been on offer at specially low rates; but few collieries have been able to sell house coals in quantities that have made their accumulations of slack a very serious obstacle. A quickening demand for domestic fuel will make a difference in this respect, as industrial consumption is not increasing at a rate to absorb much additional slack. The requirements of the electricity undertakings will become larger with the advance of the season. Good nutty slacks have been commanding from about 6s. upwards. There has been an improving demand for some hards. Notice is given of advances in household grades of coal to take effect in October.

**The Associated Electric and Monoxide Corporation** was registered as a Public Company on Sept. 6, with a capital of £200,000 in £1 shares. The objects are to carry on the business of a light and power company, to acquire and work all the patents referring to the Reid Process for the economic production of carbon monoxide gas for power and other purposes, and to take over the undertakings of the three existing Companies working the process—namely, the Reid Power Development, the Reid Process, and the Cheap Electric Power Corporation.

## CURRENT SALES OF GAS PRODUCTS.

### The London Market for Tar, Tar Products, and Sulphate.

LONDON, *Sept.* 23.

In the tar products market pitch continues firm at about 47s. 6d. per ton f.o.b.

Creosote for export remains at 6¾d. per gallon f.o.b.

Pure toluole is in demand, and is firm at 2s. 3d. per gallon; 95/160 solvent naphtha is about 1s. 5d., and pure benzole about 1s. 11d. per gallon.

Pyridine bases, 90/140, are 3s. 9d. to 4s. per gallon.

### Tar Products in the Provinces.

*Sept.* 23.

There is little or no variation in markets for tar products.

Pitch is still firm, and the demand continues. Further business has been done on the basis of 47s. 6d. f.o.b. Inquiries have continued for the second half of next year, and business is reported to be possible for this period at 47s. 6d. also.

Creosote.—There is no alteration in the market for this article.

Crude Carbolic.—The demand continues, and consumers are not only willing and anxious to purchase for January/June next, but in some cases are prepared to buy for delivery to the end of next year.

Crystals are still very firm indeed. Makers have very little left for delivery. For second-hand parcels high prices are asked; but for next year 7d. per lb. is quoted.

In other articles there is nothing of interest to report.

The average prices of gas-works products during the week were: Gas-works tar, 25s. to 30s. Pitch—East Coast, 47s. 6d. f.o.b. West Coast—(f.a.s.) Manchester, 42s. to 42s. 6d.; Liverpool, 45s. 6d. to 46s. 6d.; Clyde, 45s. 6d. to 46s. 6d. Toluole, naked, North, 1s. 7½d. to 1s. 8¼d. Coal-tar crude naphtha, in bulk, North, 9d. to 10d. Solvent naphtha, naked, North, 1s. 3d. to 1s. 3½d. Heavy naphtha, North, 1s. to 1s. 0½d. Creosote, in bulk, North, liquid and salty, 3½d. to 3¾d.; low gravity, 2d. to 2¼d.; Scotland, 3¼d. to 3¾d. Heavy oils, in bulk, North, 5¾d. to 6d. Carbolic acid, 60's, 2s. 5d. to 2s. 6d. prompt. Naphthalene, £12 to £14. Salts, £5 to £5 10s., bags included. Anthracene, "A" quality, 2½d. per minimum 40 p.ct., purely nominal; "B" quality, unsaleable.

### Benzole Prices.

The following are considered to be the market prices to-day:

| | s. d. | s. d. | |
|---|---|---|---|
| Crude benzole . . . | 0 10 | to 0 11 | per gallon at works |
| Motor ,, . . . | 1 5 | ,, 1 6 | ,, ,, |
| 90 p.ct. ,, . . . | 1 7 | ,, 1 8 | ,, ,, |
| Pure ,, . . . | 1 10 | ,, 1 11 | ,, ,, |

## TRADE NOTES.

### "Newbridge" Controllers.

The latest loose-leaf catalogue of the Horstmann Gear Company, Ltd., which deals with "Newbridge" clockwork controllers for public street lighting and other purposes, is extremely well printed and illustrated. The brochure deals exhaustively with the design and construction of "Newbridge" controllers, and all the firm's standard models are illustrated.

### Bray Burners.

From Messrs. Geo. Bray & Co., Ltd., of Leeds, we have received a copy of their latest catalogue describing the burners they manufacture. The Bray diffuser, designed to prevent lighting-back, noise, and unsteady light, has pride of place in the list. This device is made in two styles—with metal body and magnesia nozzle, or with both body and nozzle of magnesia. The one with the metal body can be used with either a single light, or with a two-light or three-light cluster; but the combined magnesia diffuser and nozzle is only suitable for a single light.

### Main Gas Fires.

A catalogue of distinction has been published by Messrs. R. & A. Main, Ltd. In it are described and illustrated the gas fires which this firm are offering for the 1929-30 season. The variety of design and numerous finishes are comprehensive. Attention is called to the "Raymain" radiant. It is claimed for it that it heats up more rapidly than did previous types, and has increased incandescence with an even glow extending to the top of the radiant. "The heat attained by the 'Raymain' radiant is smooth, comfortable, and more inviting." The design ensures a neatly-fitting fire-front.

## CONTRACTS OPEN.

### Coke-Cutting Machine.

The Sidmouth Gas Department invite tenders for the supply of a coke-cutting machine. [See advert. on p. 693.]

### Coal-Handling Plant.

The Sutton-in-Ashfield Urban District Council invite tenders for reconstructing and remodelling their coal-handling plant. [See advert. on p. 693.]

### Gasholders.

The Sutton-in-Ashfield Urban District Council invite tenders for the repairing of an existing gasholder, and the erection of a new one. [See advert. on p. 693.]

## OVERSEAS OPPORTUNITIES.

[Extracted from the Board of Trade Journal.]

### Canada.

*Cast-iron Pipe and Steel Pipe* (*10-in. and Larger*).—A manufacturers' agent in Halifax, Nova Scotia, who sells plumbing and heating equipment, &c., in the Maritime Provinces and Newfoundland, desires to obtain British agencies on a commission or consignment basis for the above pipes. (Ref. No. 325.)

### South Africa.

*Cast-iron Pipes and Specials.*—H.M. Trade Commissioner at Johannesburg reports that the Borough of Durban Water Engineer's Department is calling for tenders, to be presented in South Africa by Oct. 11, 1929, for the supply of 950 cast-iron spigot and socket pipes and 4055 cast-iron pipes, turned and bored, together with bends, collars, tees, crosses, &c. (Contract No. W. 164.) Firms desirous of offering cast-iron pipes and specials of British manufacture can obtain further particulars upon application to the Department of Overseas Trade, 35, Old Queen Street, London, S.W. 1. (Ref. A.X. 8526.)

*Steel Pipes, Collars, &c.*—H.M. Trade Commissioner at Johannesburg reports that the Borough of Durban Water Engineer's Department is calling for tenders, to be presented in South Africa by Oct. 11, 1929, for the supply of 21,798 ft. of 13-in. internal diameter steel piping, 6612 ft. of 7-in. external diameter steel piping, and 24 Kimberley collars. (Contract No. W. 165.) Firms desirous of offering steel pipes and fittings of British manufacture can obtain further particulars upon application to the Department of Overseas Trade, 35, Old Queen Street, London, S.W. 1. (Ref. A.X. 8525.)

**L. Cadec** has been registered with a nominal capital of £100 for the purpose of carrying on the business of wholesale and retail stove, boiler, grate, and mantlepiece manufacturers, gas, heating, and hot water engineers and fitters.

**Will.**—Richard Weeks Winnicott, of Hyperion, Seymour Road, Mannamead, Plymouth, lately a Director of the Plymouth and Stonehouse Gas Light and Coke Company, twice Mayor of Plymouth, and for thirty years a member of the City Council, has left gross estate of £120,693, with net personalty of £106,291.

**"Daily Dispatch" Smoke Abatement Exhibition.**—This exhibition, which will be held under the auspices of the Smoke Abatement League of Great Britain, will be staged in the City Hall, Deansgate, from Nov. 5 to 16. Judging from the stand accommodation booked, the exhibition promises to be an unqualified success. A large space has been taken by the gas industry. The organizers are Provincial Exhibitions, Ltd., City Hall, Deansgate, Manchester.

**Increased Sales at Lewes.**—At the recent meeting of the Lewes Gas Company, it was stated that the report of the Directors for the half-year ended June 30 last showed a profit of £2206 and a balance of net revenue of £2260. Dividends were declared for the past half-year at the rate of 5 p.ct. on the original capital stock and 3½ p.ct. on the additional capital stock. Mr. Oke, who presided, said that the sales of gas had increased by about 5 p.ct., while the price had been reduced by 1d. per therm.

**The Australian Gas Light Company.**—The Directors have to report that the net profits for the past year, including the balance brought forward, amount to £359,498, *less* dividend at the rate of 4 p.ct. paid on Feb. 15, 1929, which leaves a balance at the credit of profit and loss account of £199,693. The Directors recommend the payment of a dividend for the past half-year at the rate of 4 p.ct. on the "A" and "B" shares, which will absorb £164,400, leaving a balance to be carried forward of £35,293.

**Cheaper Street Lighting in Liverpool.**—It was reported to the Liverpool Tramways Committee, on Sept. 20, that, following negotiations, the Liverpool Gas Company has agreed to make further concessions in respect of the supply of gas for street lighting, which will mean a saving to the city of about £2000 a year. The price is to be reduced and the discount increased from 12½ to 20 p.ct., as long as the total gas usage amounts to over 800,000 therms per annum. At present the amount is about 890,000 therms.

**British Road Tar Association.**—The first meeting of the South-Western District Board of the Association was held at the Plymouth and Stonehouse Gas Light and Coke Company's Offices, Plymouth, on Sept. 19. Mr. J. H. Ellis presided, and Mr. W. E. Cone, Technical Adviser to the Association, outlined the policy and aims of the Association. Other speakers included Mr. F. Kilpatrick, Director of South-Western Tar Distillers, Ltd., Mr. S. J. Ingram, Managing Director of the Camborne Gas Company, and Mr. W. N. Westlake, of the Exeter Gas Company.

**Coatbridge Gas Company.**—At the ordinary general meeting of the shareholders of the Coatbridge Gas Company, Mr. Alex. S. Legat (Chairman), in moving the adoption of the Directors' report, said the sales of gas showed an increase of 4·34 p.ct. over the previous year. This increase, though comparatively small, was in the right direction, and it was really on the increasing sales of gas that the prosperity of the Company and the price of gas to consumers largely depended. They had reduced the price of gas to consumers from 8·4d. to 8d. per therm. He moved that dividends be paid at the authorized rates—viz., £14 5s. p.ct. per annum on the original stock and £9 19s. 6d. p.ct. per annum on the four issues of £10 shares—all *less* income-tax. Mr. Robert Waterston, J.P., seconded, and the report was adopted and dividends were declared accordingly.

An explosion, presumed to have been caused by an electric wire fusing and melting a gas pipe, resulted in an outbreak of fire at two shops in Ecclesall Road, Sheffield.

# STOCK AND SHARE LIST.

[For Stock Market Report, see earlier pages.]

| Issue. | Share. | When ex-Dividend | Dividends. Prev. Hf. Yr | Dividends. Last Hf. Yr. | NAME | Quotations. Sept. 20. | Rise or Fall on Week. | Transactions Lowest and Highest Prices. |
|---|---|---|---|---|---|---|---|---|
| £ | | | %p.a | % p.a. | | | | |
| 171,878 | Stk. | Aug. 15 | 5 | 5 | Aldershot 5 p.c. max. C. | 70–75 | .. | .. |
| 412,992 | ,, | ,, | 4 | 4 | Do. 4 p.c. Pref. | 73–76 | .. | .. |
| 1,661,868 | ,, | Apl. 11 | 7½ | 7½ | Alliance & Dublin Ord. | 96–99 | .. | 96½ |
| 274,000 | ,, | July 11 | 4 | 4 | Do. 4 p.c. Deb. | 62–65 | .. | .. |
| 592,655 | ,, | Aug. 29 | 7 | 7 | Barnet Ord. 7 p.c. | 112–115 | .. | .. |
| 300,000 | 1 | May 9 | 1/4½ | 1/4½ | Bombay, Ltd. | 17/6–20/- | .. | 17/6 |
| 172,500 | 10 | Aug. 29 | 8½ | 9 | Bournemouth 5 p.c. | 12½–18½ | .. | .. |
| 400,050 | 10 | ,, | 7 | 7 | Do. B 7 p.c. | 12½–12½ | .. | .. |
| 339,160 | 10 | ,, | 6 | 6 | Do. Pref. 6 p.c. | 10½–11 | .. | |
| 60,000 | Stk. | July 11 | 3 | 3 | Do. 3 p.c. Deb. | 54–57 | .. | .. |
| 162,025 | ,, | ,, | 4 | 4 | Do. 4 p.c. Deb. | 72–75 | .. | .. |
| 357,200 | ,, | Aug. 29 | 7½ | 7½ | Brighton & Hove 6 p.c. Con | 113–116 | .. | .. |
| 271,880 | ,, | ,, | 6½ | 6½ | Do. 5 p.c. Con | 100–103 | .. | .. |
| 1,387,500 | ,, | July 25 | 5 | 5 | Bristol 5 p.c. max. | 89–90a | +½ | .. |
| 665,000 | ,, | Sept. 12 | 7½ | 7 | British Ord. | 115–118* | .. | 116 |
| 100,000 | ,, | June 27 | 7 | 7 | Do. 7 p.c. Pref. | 112–117 | .. | .. |
| 120,000 | ,, | ,, | 4 | 4 | Do. 4 p.c. Red. Deb. | 71–74 | .. | .. |
| 450,000 | ,, | ,, | 5 | 5 | Do. 5 p.c. Red. Deb. | 94–97 | .. | .. |
| 100,000 | 10 | May 30 | 6 | 8 | Cape Town, Ltd. | 9–10 | .. | 9½ |
| 100,000 | 10 | Apl. 24 | 4½ | 4½ | Do. 4½ p.c. Pref. | 6½–7½ | .. | .. |
| 150,000 | Stk. | June 27 | 4½ | 4½ | Do. 4½ p.c. Deb. | 71–76 | .. | .. |
| 695,860 | ,, | July 25 | 6 | 6 | Cardiff Con. Ord. | 98–101 | .. | .. |
| 327,840 | ,, | June 27 | 7½ | 7½ | Do. 7½ p.c. Red. Deb. | 99–102 | .. | .. |
| 157,150 | ,, | Aug. 15 | 6½ | 5 | Chester 5 p.c. Ord. | 86–91b | .. | .. |
| 98,936 | 1 | May 9 | 1/- | 1/- | Colombo Ltd. Ord. | 85/–87/- | .. | .. |
| 24,495 | 1 | ,, | 1/4½ | 1/4½ | Do. 7 p.c. Pref. | 20/–22/- | .. | .. |
| 275,402 | 1 | Apl. 11 | 1/9½ | 1/9½ | Colonial Gas Assn. Ld. Ord | 24/6–26/6 | .. | .. |
| 127,848 | 1 | ,, | 1/7½ | 1/7½ | Do. 8 p.c. Pref. | 21/–23/- | +6d. | .. |
| 1,078,280 | Stk. | July 25 | 7 | 5 | Commercial Ord. | 93–96 | .. | .. |
| 475,000 | ,, | June 13 | 8 | 8 | Do 8 p.c. Deb. | 56–59 | .. | .. |
| 787,550 | ,, | Aug. 15 | 7 | 7 | Croydon sliding scale | 108–111 | .. | 109½ |
| 499,100 | ,, | ,, | 5 | 5 | Do. max. div. | 81–84 | .. | .. |
| 542,270 | ,, | Aug. 29 | 10 | 7 | Derby Con. | 118–121e | .. | .. |
| 55,000 | ,, | June 27 | 4 | 4 | Do. Deb. | 68–71e | .. | .. |
| 399,000 | ,, | Aug. 29 | 5 | 5 | East Hull Ord. 5 p.c. | 73–75 | .. | .. |
| 1,009,180 | 10 | Sept. 12 | †7 | †4 | European, Ltd. | 16–18* | .. | 16–16½ |
| 13,708,480 | Stk. | July 25 | 5½ | 5½ | Gas Light & Coke 4 p.c. Ord. | 17/9–18/3/ | .. | 17/9–18/3 |
| 2,499,000 | ,, | ,, | 8½ | 8½ | Do. 8½ p.c. max. | 61–63 | .. | 62½ |
| 4,187,930 | ,, | ,, | 4 | 4 | Do. 4 p.c. Con. Pref. | 73–75 | .. | 73–74½ |
| 4,629,630 | ,, | June 13 | 8 | 8 | Do. 8 p.c. Con. Deb. | 55–58 | –1 | 56–56½ |
| 2,642,770 | ,, | ,, | 5 | 5 | Do. 5 p.c. Red. Deb. | 97–100 | .. | 97½–98½ |
| 99,500 | ,, | Aug. 29 | 7 | 7 | Hastings & St L. 5 p.c. Conv | 98–103 | .. | .. |
| 268,740 | ,, | ,, | 5½ | 5½ | Do. 5½ p.c. Conv. | 77–82 | .. | .. |
| 70,000 | 10 | Apl. 24 | †10 | †10 | Hongkong & China, Ltd. | 14–15 | .. | .. |
| 319,200 | Stk. | Aug. 29 | 6 | 6½ | Hornsey Con. 6½ p.c. | 84–87 | .. | .. |
| 1,976,000 | ,, | May 30 | 10 | 20 | Imperial Continental Cap. | 390–410 | –30 | 387–426 |
| 333,180 | ,, | Aug. 15 | 8½ | 8½ | Do. 8½ p.c. Red. Deb. | 69–72 | .. | 70 |
| 535,242 | ,, | Aug. 15 | 7½ | 8 | Lea Bridge 5 p.c. Ord. | 115–118 | .. | .. |
| 2,145,907 | ,, | Aug. 15 | 6½ | 6 | Liverpool 5 p.c. Ord. | 93–94b | .. | .. |
| 600,000 | ,, | Mar. 21 | 7 | 7 | Do. 7 p.c. Red. Pref. | 102–104b | .. | 101½–102 |
| 165,786 | ,, | Aug. 29 | 8 | 9 | Maidstone 5 p.c. Cap. | 122–127 | .. | .. |
| 69,480 | ,, | June 27 | 3 | 3 | Do. 3 p.c. Deb. | 53–56 | .. | .. |
| 99,000 | 5 | June 13 | 18 | 110 | Malta & Mediterranean | 5½–6 | .. | .. |
| 322,000 | — | Apl. 2 | — | 5½ | Metrop'tn (of Melbourne) 5½ p.c. Red. Deb. | 99–101 | –1 | 99½ |
| 641,930 | Stk. | May 30 | 15 | 19 | Montevideo, Ltd. | 105–108 | .. | .. |
| 2,051,818 | ,, | July 25 | 5½ | 5 | Newcastle & Gateshead Con. | 17/–17/6d/ | .. | .. |
| 662,356 | ,, | ,, | 4 | 4 | Do. 4 p.c. Pref. | 71½–72½d | +½ | .. |
| 491,705 | ,, | June 27 | 8½ | 8½ | Do. 8½ p.c. Deb. | 68–69d | .. | .. |
| 181,780 | ,, | Aug. 29 | 7/1/0 | 7½ | North Middlesex 5 p.c. Con. | 110–115 | .. | .. |
| 800,000 | ,, | Apl. 24 | 9 | 7 | Oriental, Ltd. | 113–118 | –2 | 115½–117½ |
| 205,162 | ,, | June 27 | 8 | 8 | Plym'th & Ston'house 5 p.c. | 110–113 | .. | 112 |
| 424,416 | ,, | Aug. 29 | 8½ | 8 | Portsm'th Con. Stk. 4p.c. Std. | 113–118 | .. | .. |
| 241,446 | ,, | ,, | 5 | 5 | Do. 5 p.c. max. | 80–83 | .. | .. |
| 2,334,464 | 1 | June 27 | — | ‡5 | Primitiva Ord. | 32/–34/- | –2/- | 32/–34/9½ |
| 244,500 | 100 | June 8 | 4 | 4 | Do. 4 p.c. Red. Deb. | 92–95 | .. | .. |
| 695,000 | Stk. | July 25 | 4 | 4 | Do. 4 p.c. Red. Deb. 1911 | 79–82 | .. | 81½–81½ |
| 416,845 | ,, | June 27 | 4 | 4 | Do. 4 p.c. Cons. Deb. | 79–82 | .. | 81½–81½ |
| 180,000 | 10 | Mar. 21 | 6 | 6 | San Paulo 6 p.c. Pref. | 8½–9 | .. | .. |
| 1,736,968 | Stk. | Mar. 21 | 6½ | 6½ | Sheffield Cons. | 108–110e | .. | .. |
| 95,000 | ,, | Jan. 10 | 4 | 4 | Do. 4 p.c. Deb. | 74–77e | .. | .. |
| 80,000 | 10 | June 13 | ‡4 | ‡4 | South African | 4–6 | .. | .. |
| 6,092,895 | Stk. | July 26 | 7½ | 5 | South Met. Ord. | 99½–101½ | –½ | 99½–101½ |
| 500,000 | ,, | ,, | 6 | 6 | Do. 6 p.c. Irred. Pf. | 105–108 | .. | .. |
| 1,895,445 | ,, | July 11 | 3 | 3 | Do. 3 p.c. Deb. | 55–58 | –2 | .. |
| 784,000 | ,, | Sept. 12 | 6½ | 6½ | Do. 6½ p.c. Red. Db. | 98–100* | .. | 98½ |
| 91,500 | ,, | Aug. 15 | 8½ | 8½ | South Shields Con. | 103–104d | .. | .. |
| 1,843,795 | ,, | July 25 | 6½ | 6½ | South Suburban Ord. 5 p.c. | 103–106 | .. | .. |
| 458,837 | ,, | June 27 | 5 | 5 | Do. 5 p.c. Deb. | 95–98 | .. | .. |
| 647,740 | ,, | Aug. 15 | 5 | 5 | South'mpton Ord. 5 p.c max | 77–80 | .. | .. |
| 181,275 | ,, | June 27 | 4 | 4 | Do. 4 p.c. Deb. | 70–73 | .. | .. |
| 179,014 | ,, | July 25 | 8 | 8 | Sutton Ord. | 116–119 | .. | .. |
| 67,823 | ,, | June 27 | 5 | 5 | Do. 5 p.c. Deb. | 90–93 | .. | 92–92½ |
| 360,000 | ,, | Feb. 21 | 7 | 7 | Swansea 7 p.c. Red. Pref. | 100–102 | .. | .. |
| 200,000 | ,, | June 27 | 6½ | 6½ | Do. 6½ p.c. Red. Deb. | 100–102 | .. | .. |
| 1,002,275 | ,, | Aug. 15 | 6½ | 6½ | Tottenham District Ord. | 105–108 | .. | 105–106 |
| 180,000 | ,, | ,, | 5½ | 5½ | Do. 5½ p.c. Pref. | 97–100 | .. | .. |
| 181,356 | ,, | June 13 | 4 | 4 | Do. 4 p.c. Deb. | 74–77 | .. | 75½–75½ |
| 359,094 | ,, | Aug. 29 | 7 | 7 | Uxbridge, Maidenhead, & Wycombe 5 p.c. | 93–98 | .. | .. |
| 98,880 | ,, | ,, | 5 | 5 | Do. 5 p.c. pref. | 85–90 | .. | .. |
| 50,000 | ,, | July 11 | 9 | 9 | Wandsworth, Wimbledon, and Epsom— Wandsworth A 5 p.c. | 140–145 | –3 | .. |
| 256,536 | ,, | ,, | 7½ | 7½ | Do. B 8½ p.c. | 117–122 | –5 | .. |
| 482,585 | ,, | ,, | 6.3/5 | 6.3/5 | Do. C and New | 98–103 | –2 | .. |
| 983,000 | ,, | ,, | 7½ | 7½ | Do. Wimbledon 5 p.c. | 110–115 | –2 | .. |
| 98,000 | ,, | ,, | 7½ | 7½ | Do. Epsom 5 p.c. | 118–123 | –5 | .. |
| 200,000 | ,, | ,, | 5 | 5 | Do. 5 p.c. Pref | 87–92 | .. | .. |
| 99,416 | ,, | June 27 | 3 | 3 | Do. 3 p.c. Deb. | 54–57 | .. | .. |
| 264,743 | ,, | ,, | 4 | 4 | Do. 4 p.c. Deb. | 74–77 | .. | 74–75 |
| 397,500 | ,, | ,, | 5 | 5 | Do. 5 p.c. Deb. | 93–98 | .. | .. |

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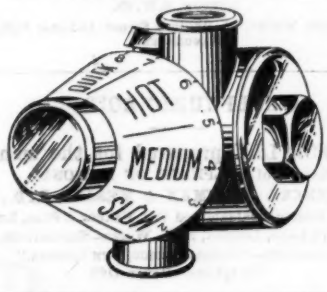


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